TESIS DOCTORAL

Essays on International Finance and Macroeconomics

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ABSTRACT

The recent years have shown an increasing number of inter-linkages across countries. This surely is a result of what is called the integration phenomenon. Looking at the financial side, stock and bond markets have become more intertwined across countries leading to a simplification of trade in securities and goods. Banking sectors across borders on the other hand have come to be more unified, allowing countries to increase the number of operations further boosting trade and helping promote domestic growth and development. To this end my dissertation has studied the recent phenomenon of financial integration and its effect on economic growth and financial development. Moreover it examined the impact of the most recent measures taken at the European level that are established to promote greater integration and harmonization.

The first chapter of the dissertation, "Financial Openness and Financial Development: An Analysis Using Indices" studies the link between financial openness and financial development through panel data analysis on advanced and emerging market countries. Using indices, financial openness together with institutional, educational and macroeconomic variables is shown to explain a large part of the variation in financial development across countries and over time. The analysis demonstrates that different indexing strategies could serve in finding better measures in terms of significances for financial openness and financial development in comparison to the individual indicators used in the literature. Principal component type financial openness index conveys a positive effect on financial development independent from the lag structure chosen, time dummies and trends used.

The second chapter of the dissertation, "Financial Harmonization and Industrial Growth: Evidence from Europe" analyzes the growth effects of the Financial Services Action Plan (FSAP) of the European Commission, a set of measures and directives that aim to harmonize European financial markets. Using a panel of 25 countries and 30 industries, the standard specification predicts harmonization to lower growth, though the negative effect is mitigated for industries that depend more on external finance. This seemingly surprising result however occurs as a result of omitted variable bias. As in any policy implementation, early adopters are more likely to bear higher costs and experience less of the benefits of harmonization. Controlling for the relative timing of adoption, harmonization is then shown to have a positive effect on growth. This finding is robust to including further controls, splitting up the sample into different groups of countries, and extending the model to a dynamic setting.

The third and the last chapter of the dissertation, "Financial Harmonization and Financial Development: An Application of Europe's Financial Services Action Plan" examines the Financial Services Action Plan (FSAP) of the European Commission which intends to create an open, secure, integrated financial market across EU member countries. Although recent research has shown a positive impact of the FSAP directives on cross-border lending and industrial growth the effect on financial development remains to be examined. Using principal component analysis to construct financial, banking sector, bond and stock market development indices, this paper investigates the impact of financial harmonization policies of the FSAP on financial development in a panel of twenty five EU member states for the period of 1996 – 2007. Taking into account the timing perspective in implementing the FSAP directives across countries financial harmonization is found to positively affect financial development. The results are shown to be robust to different approaches in constructing the harmonization index and the harmonization difference (relative timing of adoption) variable, adding further controls, and extending the analysis to include the data for the recent period.

RESUMEN

En los últimos años hemos presenciado un incremento en el número de vínculos entre los países. Esto sin duda es un resultado de lo que se denomina fenómeno de integración. Mirando el lado financiero, los mercados de acciones y bonos se han entrelazadas más entre los países, llevando a una simplificación del comercio de valores y mercancías. Los sectores bancarios a través de fronteras, por otra parte han llegado a estar más unificados, lo que permite a los países a aumentar el número de operaciones para impulsar aún más el comercio y ayudar a promover el crecimiento interno y el desarrollo. Con este propósito, mi tesis estudia el fenómeno reciente de la integración financiera y su efecto sobre el crecimiento económico y el desarrollo financiero. Además se analiza el impacto de las medidas más recientes adoptadas a nivel europeo que se establecieron para promover una mayor integración y armonización.

El primer capítulo de la tesis, "Apertura Financiera y Desarrollo Económico: un Análisis utilizando Índices" estudia la relación entre la apertura financiera y el desarrollo económico mediante un análisis de datos de panel de países avanzados y países emergentes. Utilizando los índices, se muestra que la apertura financiera, junto con variables institucionales, educativas y macroeconómicas explica una gran parte de la variación en el desarrollo financiero entre los países ya lo largo del tiempo. El análisis demuestra que las diferentes estrategias de indización podrían ser útiles en la búsqueda de mejores medidas en términos de significatividad para la apertura financiera y el desarrollo financiero en comparación con los indicadores individuales utilizados en la literatura. Los índices de apertura financiera de componentes principales transmiten un efecto positivo en el desarrollo financiero independiente de la estructura de retardos elegida, dummies temporales y tendencias utilizadas.

El segundo capítulo de la tesis, "Armonización financiera y Crecimiento Industrial: Evidencia de Europa" analiza los efectos de crecimiento del Plan de Acción de Servicios Financieros (SFAP) de la Comisión Europea, un conjunto de medidas y directivas dirigidas a armonizar los mercados financieros europeos. Utilizando un panel de 25 países y 30 industrias, la especificación estándar predice la armonización a menor crecimiento, aunque el efecto negativo se ve mitigado por las industrias que dependen más de la financiación externa. Este aparentemente sorprendente resultado, sin embargo, se produce como resultado del sesgo de variables omitidas. Como en cualquier aplicación de políticas, los primeros usuarios son más propensos a enfrentar mayores costes y experimentar menores beneficios de armonización. Controlando por el tiempo de adopción, la armonización muestra entonces tener un efecto positivo en el crecimiento. Este hallazgo es robusto a la inclusión de nuevos controles, dividiendo la muestra en diferentes grupos de países, y extendiendo el modelo a un entorno dinámico.

El tercer y último capítulo de la tesis, "Armonización Financiera y Desarrollo Económico: Una Aplicación del Plan de Acción de Servicios Financieros Europeo", analiza el Plan de Acción de Servicios Financieros (SFAP) de la Comisión Europea, que pretende crear un mercado financiero integrado, abierto y seguro para los países miembros de la UE. Aunque la investigación reciente ha demostrado un impacto positivo de las directivas del SFAP en los préstamos transfronterizos y el crecimiento industrial, queda por examinar el efecto sobre el desarrollo financiero. Mediante el análisis de componentes principales para la construcción de los índices de desarrollo de los mercados financieros, el sector bancario, y los mercados de bonos y acciones, este trabajo investiga el impacto de las políticas de armonización financieros de la SFAP en el desarrollo financiero de un grupo de veinticinco Estados miembros de la UE para el período de 1996 a 2007. Teniendo en cuenta la perspectiva de los tiempos de implementación de las directivas del SFAP en los países, se concluye que la armonización financiera influye positivamente

en el desarrollo financiero. Los resultados se muestran robustos a diferentes enfoques en la construcción del índice de armonización y la diferencia de armonización (tiempo relativo de adopción), a la adición de más controles, y a la extensión del análisis para la inclusión de los datos para el período más reciente.

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CHAPTER 1

Financial Openness and Financial Development: An Analysis Using Indices

Abstract

This paper examines the link between financial openness and financial development through panel data analysis on advanced and emerging market countries. Using indices, we show that financial openness together with institutional, educational and macroeconomic variables can explain a large part of the variation in financial development across countries and over time. Our analysis demonstrates that different indexing strategies could serve in finding better measures in terms of significances for financial openness and financial development in comparison to the individual indicators used in the literature. Principal component type financial openness index conveys a positive effect on financial development independent from the lag structure chosen, time dummies and trends used.

1.1 Introduction

In the wake of the recent financial crisis, the role of financial development in emerging markets and developed countries has gained further interest among researchers. Financial development, the channel for increasing the efficiency of financial markets and resources and improving on the overall importance of the financial system, has become one of the main elements that influences economic growth and welfare (Huang, 2006).

Although the role of financial development on economic growth is newly recognized, a wide spread debate on the effects of financial liberalization on growth and financial development is ongoing. Studies have shown that financial liberalization through alleviation of capital controls and deregulation of financial markets can endorse economic growth and enhance welfare by creating opportunities for a better and more efficient allocation of resources and by portfolio and risk diversification under appropriate controls, frameworks and regulatory apparatus (Aziakpono, 2007; Chinn and Ito, 2006).

The literature provides a broad examination of financial liberalization and economic growth, nevertheless, the link between financial liberalization and financial development has been overlooked. A proper analysis of this link will help clarify the ambiguity in the relationship between financial liberalization and economic growth. Our paper, by this means, examines the effects of financial openness, the most prominent measure of financial liberalization, and financial development through a panel study of developed and emerging market countries. Using indices we show that financial openness together with institutional, educational and macroeconomic variables can explain a large part of the variation in financial development across countries and over time. Principal component type indices provide better results in terms of economic and statistical significances. The robustness checks and the heterogeneity analysis convey that findings are robust to different lag structures, time dummies and trends, specifications and reductions in the sample size. A graphical examination of our results reveals that the indices correspond to economical and political events that occured during the period of our sample.

The small strand of literature attempts to answer the question regarding the effects of trade and capital account openness on financial development. Chinn and Ito (2002) and (2006), Ito (2006), Baltagi, Demetriades and Law (2007), Demetriades and Law (2006), Demetriades and Andrianova (2005) and Huang (2006) show that financial liberalization (capital account openness in most cases) contributes to financial development in equity and stock markets for both less developed and emerging market countries. There are, however, three main issues in examining the link between financial openness and financial development. Firstly, the choice of indicators has been a topic of concern. Studies lack a comprehensive indicator that can bring together all features of financial development; the banking system, the stock and the bond markets. With different measures used for financial openness and for financial development, the results obtained seem unconvincing. Another concern is that the results from various studies become hardly comparable due to the particular choice of individual measures and due to the country and time coverage selected for the study. Constructing better financial openness and financial development indices will help resolve problems associated with particular choice of measures. Secondly, the number of countries included in most studies is limited. Due to the lack of data for many less developed and some emerging market countries, most studies use developed countries in their estimations, which highly influence the results. Lastly, what seems to be a minor issue, which in reality can affect almost all findings, is the choice of control variables. The literature shows that the choice of control variables can influence the link between financial openness and financial development. Correct specification of control variables can lead to a better examination of these concepts.

Compared to the existing literature we contribute in three aspects. First, we give a view on different indices for financial openness and financial development straining away from choosing individual variables which we believe do not fully represent the aspects of financial openness and financial development. Second, we examine the simultaneity hypothesis of opening financial and goods markets with indices. Lastly we explicitly study one of the main problems of panel data models; heterogeneity issues. We complement Huang's (2006) work by suggesting additional principal components type indices for financial openness and financial development and by offering a first-time comparison among different types of indices used in the analysis.

This paper is organized as follows. In the next section we introduce the data. Section 3 describes the construction of aggregate indices of financial openness and financial development. Section 4 provides a discussion of the empirical model. Section 5 reports our estimation results. Section 6 discusses the robustness checks and further issues related to our sample. Section 7 concludes.

1.2 Data

The analysis is based on annual data for 61 developing and advanced countries, over a 12 year period of 1996 - 2007. The data are obtained primarily from Beck, Demirguc-Kunt, and Levine's database on *Financial Development and Structure* (referred as *BDL* from onwards), the World Bank's *World Development Indicators (WDI)*, *Worldwide Governance Indicators,* and *Edstats* which extracts data from the UNESCO Institute for Statistics.

1.2.1 Financial Openness Indicators

Financial openness is measured with *foreign direct investment (% of GDP)*, *portfolio investment flows (% of GDP)*, and *international debt issues (% of GDP)*.

Foreign direct investment, is the sum of net inflows and outflows of foreign direct investment recorded as a percentage of GDP. This indicator adds up equity capital, reinvestment of earnings and other short- and long-term capital (World Bank, 2007). *Portfolio investment flows (% of GDP)*, is the sum of portfolio debt flows (private and publicly guaranteed and private nonguaranteed bond issues purchased by foreign investors) and non-debt-creating portfolio equity flows.[1] *International debt issues (% of GDP)* measures "the net flow of international bond issues relative to a country's economic activity."(Beck and Demirguc-Kunt, 2009, 15).[2]

As summarized by Kose et.al (2006) financial openness indicators are divided into two mainstream measures; de jure measures which depend on the removal of legal restrictions and controls on cross-border capital flows, and on prices, quantities and foreign equity holdings and de facto measures which observe countries' actual integration into the world capital and financial markets through flow variables. De jure measures such as the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) typically illustrate the number of years for which a country's capital accounts have been open and free from

[1] Non-debt-creating portfolio equity flows are defined as the sum of country funds, depository receipts, and direct purchases of shares by foreign investors (World Bank, 2007).

[2] The literature suggests the use of gross foreign direct investment, gross private capital flows, and some independent indices as measures of financial openness. Gross private capital flows are excluded from our analysis and are replaced by portfolio investment flows due to their discontinuity by the World Bank.

restrictions and controls. The AREAER measure, Chinn and Ito's (2005) capital openness measure, Quinn's capital account openness index (1997, 2003), Mody and Murshid's (2005) and Edwards' (2005) measures on capital and current account restrictions are based on narrative, discrete 0-1 type variables that demonstrate openness or closedness of capital accounts (Bussiere and Fratzscher, 2004). De jure measures have long been accused of not fully reflecting the degree of financial or capital account openness due to their reliance on the removal of restrictions associated with foreign exchange transactions (Kose, Prasad, Rogoff and Wei, 2006). Although they aim to measure financial globalization in terms of openness of capital and financial markets, they do not represent the extent of integration into the global markets. Alternatively, de facto measures which are grouped into price differential and quantity based indicators focus on legal restrictions and capital flows. However, due to the difficulty in interpreting and utilizing price differential based de facto measures, quantity based indicators of financial openness are more frequently used. Although quantity based de facto measures such as gross capital flows may cause measurement errors and create difficulty in overcoming endogenity and causality issues, they remain to be the superior measure of financial integration (Kose, Prasad, Rogoff and Wei, 2006). For all of the above reasons, we restrain from using discrete de jure type measures and prefer to use stock and flow variables to measure financial openness.[3]

1.2.2 Financial Development Indicators

Financial development indicators consist of banking system, stock market and bond market measures. Below we discuss each group of measures in detail.

We use five indicators to measure the development of the banking sector. These variables are *liquid liabilities (% of GDP), private credit by deposit money banks and other financial institutions (% of GDP), the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), total bank assets (% of GDP),* and *domestic credit provided by the banking sector (% of GDP).* The annual data is obtained from the *Financial Development and Structure database* by BDL and the World Bank's *WDI*.

a) Banking sector development indicators:

Liquid liabilities (% of GDP) equals the ratio of liquid liabilities of bank and nonbank financial intermediaries to GDP (Demirguc-Kunt, Levine, 2001). This variable is commonly used as a measure of financial sector development and is a typical measure of financial depth.

Private credit by deposit money banks and other institutions (% of GDP) is an indicator for the overall development in private banking markets (Chinn and Ito, 2006). This variable includes financial resources provided to the private sector by deposit money banks and other financial institutions. It measures the credit provided to the private sector.

The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages) is used to demonstrate the weight of deposit money bank assets among total assets. It reflects the importance of private lending compared to total lending (Huang, 2006).

Total bank assets (% of GDP) is used as a measure of financial depth. It is used to represent the overall size of the banking sector.

[3] We only report the results for one of the most popular de jure type indices, the Chinn and Ito index of capital openness for comparison reasons. We believe that these results guide in demonstrating the strength of our de facto type financial openness index in comparison to the individual de facto measures by the literature.

Domestic credit provided by the banking sector (% of GDP) includes credit extended to the private sector and general government, to the nonfinancial public sector in the form of investments in short- and long-term government securities, to banking and nonbank institutions and includes loans to state enterprises but excludes credit to the central government (World Bank, 2007). It is a measure of banking sector depth and financial sector development in terms of size (World Bank, 2007).

The variables for banking sector development correspond to those used in the literature. We believe that a wide range of different variables will help capture all aspects of banking sector development.

b) Stock market development indicators:

Three different variables are used to measure development in stock markets. These variables are *stock market capitalization (% of GDP), stock market turnover ratio (in percentages),* and *stock market total value traded (% of GDP).* The data listed below is annual and is extracted from the *Financial Development and Structure database* of BDL.

Stock market capitalization (% of GDP) is equal to the value of listed shares divided by GDP. It is an indicator of the size of the stock market. *Stock market turnover ratio (in percentages)* is used as the efficiency indicator of stock markets (Demirguc-Kunt and Levine, 2001). It is classified as the ratio of the value of total shares traded to stock market capitalization. *Stock market total value traded (% of GDP)* is equal to the total shares traded on the stock market exchange divided by GDP. This indicator measures the activity or liquidity of the stock markets (Demirguc-Kunt and Levine, 2001).

Stock market development indicators used correspond to the ones found in the literature. We believe that these three variables will summarize all prospects of stock market development.

c) Bond market development indicators:

Private bond market capitalization (% of GDP) and *public bond market capitalization (% of GDP)* are the two indicators used to measure bond market development. Data is reported annually from the *Financial Development and Structure database* of BDL.

Private bond market capitalization (% of GDP) is equal to the total amount of outstanding domestic debt securities issued by financial institutions and corporations as a share of GDP. *Public bond market capitalization (% of GDP)* is equal to the total amount of public domestic securities issued by governments as a share of GDP. Both of these indicators are used to determine the efficiency of bond markets.

Bond market development indicators have not been previously used in the literature on financial openness and financial development. Even though they have been employed extensively in the equity market development literature, due to their short period of availability they have not been used as indicators for financial development. In our analysis we propose using the bond market development indicators in order to capture the efficiency and the effectiveness of bond markets on the overall level of financial development.

1.2.3 Control Variables

To examine the effect of financial openness on financial development we introduce a broad range of control variables. These variables allow for analyzing the true impact of financial openness on financial

development. The control variables include *GDP per capita, trade openness, secondary school enrollment rate,* and *legal and institutional variables.* The data come from the World Bank's *WDI* and the *Worldwide Governance Indicators*, and *Edstats*. We summarize the control variables below.

Logarithm of GDP per capita (in constant 2000 US dollars) is used as a measure for economic performance among countries. We employ this measure to control for the demand of finance and to monitor the differences in performances and productivities across countries.[4]

Trade openness (% of GDP) measured by the sum of imports and exports of goods and services is used to determine whether trade liberalization is a precondition for financial liberalization. Controlling for trade openness allows examining the direct effects of financial liberalization on financial development.

Secondary school gross enrolment rate (% of population) is used as an indicator that controls for differences in educational attainment across countries. We consider this measure as an important reason for why we observe disparities across countries in their levels of financial development. Even though an educational attainment indicator has not been used previously as a control variable in the financial openness and financial development literature, we believe that its inclusion can alter our findings. If wide educational gaps which are observed between developed, and less developed countries affect the link between financial openness and financial development, then the exclusion of such a variable would certainly introduce a measurement bias. Following the examples of the educational attainment indicators from the economic growth literature we use secondary school gross enrollment rate as a control for educational attainment.

Lastly we employ four *legal and institutional measures* to control for institutional, legal, political and economic factors that may affect the overall level of financial development. These indicators are constructed using subjective, perceptions-based data that reflect views of respondents, agencies and organizations. We use *government effectiveness*, *regulatory quality, rule of law,* and *control corruption* as measures of legal and institutional quality. These variables do not fluctuate widely across time and are measured in a range from -2.5 to 2.5 where higher values correspond to better governance outcomes.[5] Given that our analysis is based on panel data specifications that vary across time, the use of almost time-invariant control variables may constitute a main drawback. However, as Chinn and Ito (2006) explain, the inclusion of these time-invariant factors do not pose a substantial problem for our analysis since the characteristics of the institutional quality variables are likely to change very slowly (Chinn and Ito, 2006). On this note, due to the relatively small fluctuation structure of these indicators, we take averages of two consecutive years to replace the missing years' data in the *Worldwide Governance Indicators* database for four legal/institutional quality variables.

1.3 Aggregate Indices

By aggregating different measures of financial openness and financial development into a single index we summarize the comprehensive nature of the financial sector. We describe four different indexing techniques below.

[4] Chinn and Ito (2006) argue that logarithm of GDP per capita is important in accentuating the link between financial deepening and rising income levels.

[5] Please refer to the Worldwide Governance Indicators (WGI) dataset. 1996 – 2009. World Bank. http://info.worldbank.org/governance/wgi/resources.htm

1.3.1 Equally weighted indices

We construct equally weighted indices for financial openness, banking sector, bond and stock market, and overall financial development as well as for institutional quality. The biggest concern with equally weighted indicators is that the weight structure may over-or-underestimate the importance of such measures which could potentially bias our results. In order to avoid this possibility we construct indices using other approaches.

1.3.2 Coefficient of variation type indices

The second methodology uses the coefficient of variation approach.[6] The weights for financial openness, financial development, and institutional quality are calculated using the coefficient of variation for each variable and the sum of all coefficients of variation for all variables to be used in the index. Weights following this method are constructed as follows:

$$w_i = \frac{cv_i}{scv}$$

where scv is the sum of all coefficients of variations for variables, and cv_i is the coefficient of variation for each variable *i,* and is calculated as:

$$cv_i = \frac{\sigma_i}{\mu_i}$$

μ_i and σ_i in the above equation represent the mean and standard deviations of each variable *i*.
This procedure allows for weighing each variable differently in the financial openness, financial development and institutional quality indices. It thereby helps avoid the potential bias that may occur when using equal weights.

We can construct an index for financial openness as:

$$Financial\ openness_{i,t} = \sum_{i=1}^{3} w_i\ (meas)_{i,t}$$

where w_i is the relative weight of each variable in the financial openness index and $meas_i$ denotes each of the measures used for constructing the financial openness index. $meas_i$ represents foreign direct investment (% of GDP), international debt issues (% of GDP) and portfolio investment flows (% of GDP). Similarly, banking sector, bond and stock market and financial development, and institutional quality indices are constructed as weighted averages of the corresponding variables using the above methodology.

1.3.3 Principal component analysis for creating indices

Principal components analysis in its simplest form involves a mathematical procedure that helps transform a number of possibly correlated variables into a smaller number of uncorrelated ones. Principal components has two main objectives; reducing the dimensionality of the data set, and identifying new meaningful variables.[7]

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[6] For more information please refer to: Ullah, Aman, and Davide E. A Giles. 1998. *Handbook of Applied Economic Statistics*, N.Y: Marcel Dekker, Inc. and Sheret, Michael. 1984. "The Coefficient of Variation: Weighting Considerations." *Social Indicators Research*, 15 (3):289 - 295

[7] For a more in depth discussion of the principal component analysis please refer to Jackson (1991), Dunteman (1989) and Jolliffe (2002).

Our dataset contains a large number of variables which summarize the information for both financial openness and financial development. This method has been shown to be more efficient in establishing optimal weights of variables in comparison to other methods where variables are given equal or subjective weights.
The theory behind the principal components analysis is as follows:
Suppose that y_1 is a principal component of $x_1, x_2, x_3, \ldots, x_p$ such that:

$$y_1 = a_{11}x_1 + a_{12}x_2 + \cdots + a_{1p}x_p = \sum_{i=1}^{p} a_{1i}\, x_i$$

Then the variance of y_1 is maximized given the constraint that the sum of the squared weights of $x_1, x_2, x_3, \ldots, x_p$ is equal to one (Hatcher, 1994). That is:

$$\sum_{i=1}^{p} a_{1i}^2 = 1$$

The random variables, x_i are standardized scores or deviations from the mean scores (Hatcher, 1994).[8] Using principal component analysis we find the optimal weight vector ($a_{11}, a_{12}, \ldots, a_{1p}$) and the associated variance of y_1, λ_1 (Hatcher, 1994). Similarly for the second principal component, y_2, we follow the same procedure of finding a second weight vector, ($a_{21}, a_{22}, \ldots, a_{2p}$) such that the variance of :

$$y_2 = a_{21}x_1 + a_{22}x_2 + \cdots + a_{2p}x_p = \sum_{i=1}^{p} a_{2i}\, x_i$$

is uncorrelated with the first principal component and

$$\sum_{i=1}^{p} a_{2i}^2 = 1$$

This shows that y_2 has the next largest sum of squared correlations with the original variables. The variances of the principal components thereby become smaller as we extract successive principal components from our model (Hatcher, 1994).[9] One major problem using principal component analysis is to decide how many components to retain. Four different criterions are suggested in the literature; eigenvalue-one criterion, the scree test, proportion of the variance accounted for by each component, and the interpretability criteria. In this analysis we use the first component which accounts for the maximal amount of variance among the observed variables (Hatcher, 1994). However, in order to avoid particular bias, we suggest a different principal component method that relies on information from all components.

We construct principal components indices for financial openness, financial development and institutional quality. For financial development we construct three sub-indices; the banking sector development index, the stock market development index and the bond market development index.

[8] A score is "a linear composite of the optimally-weighted observed variables." (Hatcher, 1994, 11). We use standardized scores or deviations of the observed variables from their means in order to attain observations with zero mean and unit variance in each column.
[9] The variable weights for a particular principal component are used in interpreting the principal component factor, and the magnitude of the variances calculated for principal components depicts how well the variables account for the variability of the data (Hatcher, 1994).

(a) First score principal component índices

To construct our principal component type indices using the first approach we score the first principal component of three individual measures of financial openness. Similarly the indices of financial development will be determined by the first principal component of a total of 10 variables. We construct first principal component indices for banking sector, stock and bond market development. Institutional quality index is constructed using the first score of the four variables; government effectiveness, regulatory quality, rule of law and control of corruption.

(b) Principal components indices that account for information from all components

We utilize an additional principal component index that takes into account all possible components. By doing so, we do not discard any information that could potentially affect our estimations.
This principal component index proposed by Bo and Woo (2008) offers a method for calculating weights for individual measures.[10] According to this methodology the weights for each measure of the index are constructed as follows:

$$w_j = \frac{\sum_{i=1}^{i=p} \lambda_i \alpha_j^i}{\sum_{i=1}^{i=p} \lambda_i}$$

where λ_i *(i =1,…,p)* is the *i*th eigenvalue and α^i_{px1} (*i = 1, …, p)* is the *i*th eigenvector of the correlation matrix R_{pxp} respectively (Bo and Woo, 2008). Supposing that $\lambda_1 > \lambda_2 > \lambda_3 > \ldots > \lambda_p$ and denoting the *i*th principal component as PC_i we obtain:

$$PC_i = X\alpha^i$$

where *X* represents a multi-dimensional matrix that is compromised of normalized transformations of the variables it includes and:

$$\lambda_i = var(PC_i)$$

This implies that the first principal component is the linear combination of the initial indicators, and has the largest variance (Bo and Woo, 2008). The second principal component has the second largest variance and is a linear combination of the indicators which is orthogonal to the first principal component, and the *p*th principal component is a linear combination of the indicators and has the smallest variance.
The index is constructed taking into account the relative importance of all indicators:

$$Index = \frac{\sum_{i=1}^{i=p} \lambda_i PC_i}{\sum_{i=1}^{i=p} \lambda_i} = \frac{\sum_{i=1}^{i=p} \sum_{j=1}^{i=p} \lambda_i \alpha_j^i x_j}{\sum_{i=1}^{i=p} \lambda_i} = \sum_{j=1}^{j=p} w_j \, x_j$$

where x_j (j = 1, …, p) is the *j*th column of the matrix X and w_j is the final weight of the indicator *j*. All variables that constitute the *j*th column of the matrix X, $x_{j,}$ are standardized. One important remark is in place; the sum of the weights expressed by the formula above does not necessarily have to equal unity. This is due to the fact that the principal component analysis in its underlining structure normalizes the mode of

[10] The principal components methodology of Bo and Woo (2008) is similar to that proposed by the United Nations Conference on Trade and Development (UNCTAD) for constructing the Trade and Development Index. Bo and Woo (2008/2010), Nagar and Basu (2002) and Klein and Ozmucur (2002/2003) provide different approaches in constructing indices analogous to the Trade and Development Index (TDI) with minor alterations.

each eigenvector to unity. The weights therefore could be very close to but not always equal to 1 (Bo and Woo, 2008).

Following this methodology and taking into account information from all components, we construct indices with standardized individual measures for financial openness, banking sector, stock and bond market development, financial development and institutional quality.[11] This avoids any potential problem that could arise as a result of using different scales or units of measurement.

1.4 Empirical Model

There have been various approaches employed in literature for the estimation of the link between financial openness and financial development. While Chinn and Ito (2006) utilize simple, point estimate OLS, Huang (2006) argues for fixed effects estimation with levels, OLS estimation with first differences, and Arellano-Bond dynamic panel data model approach with GMM estimators. Baltagi, Demetriades, and Law (2007) and Demetriades and Law (2006) find dynamic panel data models appropriate.
A standard static specification of the problem is as follows:

$$FD_{it} = \alpha_i + \beta FO_{it} + \sum_{j=1}^{s} \lambda_j \, Control_{jit} + \varepsilon_{it}$$

where FD_{it} is the financial development measure, FO_{it} is the financial openness measure, $Control_{jit}$ is the group of control variables of trade openness, logarithm of GDP per capita, secondary school enrollment rate, and institutional quality. α_i represents country specific effects that are captured neither by the financial openness indicators nor by the control variables. β is the coefficient on financial openness measures which we expect to be positive. It summarizes the total effect of financial openness on financial development and helps determine the effectiveness of the link between the two. Dealing with unobserved heterogeneity one can refer to the within-group fixed effects and first differences estimators. Unfortunately neither estimator captures the partial adjustment property that accounts for the new information that explanatory variables that carry out (Huang, 2006). Given that this is accounted for in the dynamic panel data models, we prefer to use a dynamic model in comparison to within-group fixed effects estimators, or first difference estimators. To obtain consistency in dynamic panel data estimations we employ the Arellano-Bond GMM panel data procedure to overcome the Nickell bias that occurs when the lagged dependent variable is correlated with the disturbance. Ultimately our Arellano-Bond dynamic panel data model of 61 countries and twelve years, 1996 – 2007, can be represented as:

$$\Delta FD_{it} = \sum_{k=1}^{n} \gamma_k \, \Delta FD_{it-k} + \beta \Delta FO_{it} + \sum_{j=1}^{s} \lambda_j \, \Delta Control_{jit} + \Delta \varepsilon_{it}$$

where γ_k measures the speed of adjustment, and β denotes the short-run effect of financial openness on financial development.[12]

[11] This method makes use of all eigenvectors and proposes to use weights depending on the eigenvectors and eigenvalues.

[12] Any influence of financial openness is now conditioned on the history controlled by the first differenced lagged dependent variable (Huang, 2006). This model is a restricted version of the static fixed effects specification given above and it includes dynamic effects through the lagged dependent variable that is included as a right hand side regressor.

The above model no longer has a country specific effect. The Arellano-Bond dynamic panel data model accounts for the individual effects. All terms in the above model have been differenced in order to elude the Nickell bias. Moment conditions require that:

$$E[FD_{it-k}\Delta\varepsilon_{it}] = 0 \text{ for } \forall k \geq n+1$$

This condition guarantees the lagged dependent variable to be uncorrelated with the first difference of the error terms although the first difference of the lagged dependent variable could easily be correlated with the first difference of the error terms.

Two diagnostic tests for serial correlation are derived by the model. We expect to find first order serial correlation in first differenced residuals because $\Delta\varepsilon_{it}$ and $\Delta\varepsilon_{it-1}$ contain the same term, ε_{it-1}. Second order and higher serial correlations could create further problems due to the difficulty in verifying the validity of the moment conditions.

To test for overidentifying restrictions we perform Sargan tests. In estimations we allow for one lag of the dependent variable to be used as a right hand side regressor, and one lag of variables other than the dependent variable to be used as instruments. We do not include the lag of the dependent variable as an instrument. We utilize the Arellano-Bond two-step estimator to avoid any panel-specific autocorrelation and to obtain better results of diagnostics.

Given our model background, following Baltagi, Demetriades, and Law (2007), we test for the following hypotheses:

(a) Do both trade and financial openness influence financial development? What happens to financial development when we control for trade openness? What are the effects of economic and legal institutions on financial development over and above the effects of openness? Do educational indicators affect financial development?
(b) Does simultaneous opening of both financial and trade accounts bring additional benefits to financial development?

Following these two hypotheses, we specify the following dynamic equations for financial development:

Model (a): (Without an interaction term)

$$\Delta FD_{it} = \gamma\Delta FD_{it-1} + \beta\Delta FO_{it} + \lambda_1\Delta TO_{it} + \lambda_2\Delta logGDPpc_{it} + \lambda_3\Delta INSQUA_{it} + \lambda_4\Delta SECSCHOOL_{it} + \Delta\varepsilon_{it} \quad (1.1)$$

Model (b): (With an interaction term)

$$\Delta FD_{it} = \gamma\Delta FD_{it-1} + \beta\Delta FO_{it} + \lambda_1\Delta TO_{it} + \lambda_2\Delta logGDPpc_{it} + \lambda_3\Delta INSQUA_{it} + \lambda_4\Delta SECSCHOOL_{it} + \lambda_5\{\Delta FO_{it} \times \Delta TO_{it}\} + \Delta\varepsilon_{it} \quad (1.2)$$

where FD_{it} is the financial development index, FO_{it} is the financial openness index, TO_{it} is the trade openness measure, $logGDPpc_{it}$ is the natural logarithm of GDP per capita, $INSQUA_{it}$ is the institutional quality index and $secschool_{it}$ is the secondary school enrollment rate.

The two models express the link between financial openness and financial development and examine whether a simultaneous effect of financial and trade openness leads to additional benefits in terms of financial development. In the first model, Model (a), we would expect to have positive and significant coefficients for both β and λ_1. Similarly if λ_3 and λ_4 are found to be positive then, improvements in institutions and in the quality of legal systems and education will enhance financial development. To test for the second model, Model (b), we introduce an interaction term which represents the significance of opening both markets at the same time. If λ_5 is found to be positive, we can state that the simultaneity hypothesis between financial and trade openness has additional benefits for financial development.

Both models serve to advance the literature in terms of the methods used in the estimation process. Our model argues for a broader range of countries with variables affecting both financial openness and financial development. We hope to complement the work by Baltagi, Demetriades, and Law (2007) through an in depth examination of the simultaneity hypothesis with our indices. Given our objective of establishing the importance of financial development as an element influencing economic growth and welfare, and given that the literature has yet to find an answer to why we observe differences among countries in extracting the advantages of financial liberalization, our analysis stands as a starting point for determining the transition mechanism between financial openness and financial development.[13]

There remain to be a few drawbacks in our estimations. The literature shows that in many cross-sectional studies both developing and advanced countries are lumped together in the same sample. As Henry (2006) explains, including both sets of countries increases the sample size and could lead to more efficient results in estimation. However, doing so without employing an empirical methodology, which particularly recognizes the fundamental theoretical difference between advanced and developing countries, would undermine the study's ability to interpret the data. In order to correct for the problem, we first estimate our model with a full sample and then subgroup the data into developing and developed countries so as to compare the results obtained in both estimation procedures.

1.5 Empirical Results

We discuss the results of the dynamic panel data model. Table 1.1 in the Appendix gives a brief summary of the variables used in our estimation procedure. Tables 1.2 (a) to (d) depict the relations of the indices and the control variables. Overall the results demonstrate that all indices have high correlations with each other while the banking sector development index has higher correlations with the financial development index.

1.5.1 Results using equally weighted indices

Our empirical estimations for equally weighted indices are presented in Table 1.4 (a).[14] In the benchmark dynamic GMM estimations, all variables other than the lags of the dependent variable are treated as

[13] Our indexing strategies allow the data to tell us how to measure financial openness and financial development. By not choosing individual indicators for financial openness and financial development, we argue that our index measures will help overcome the problem of the particular use/choice of individual measures that exists in the literature.

[14] In the benchmark dynamic GMM estimations, all variables other than the lags of the dependent variable are treated as exogenous.

exogenous. The four dependent variables used in our regressions are banking sector, bond and stock market, and financial development indices. Table 1.4 (a) shows that the equally weighted financial openness index is statistically significant for 3 columns. Financial openness has a positive coefficient for all dependent variables but the equally weighted bond market index.[15]

The rest of the results from Table 1.4 (a) indicate that trade openness is positive and significant for all development indices, whereas logarithm of GDP per capita is significant and positive for all dependent variables with the exception of the equally weighted bond market index. The equally weighted institutional quality index is negatively significant for three dependent variables. This finding contravenes the one of the literature which states that the effects of higher development in terms of institutions should be carried out to all sources of financial development. Baltagi, Demetriades and Law (2007) using individual dependent variables find institutional quality to be positive whenever significant but negative when the stock market capitalization is used as the dependent variable. Similarly Chinn and Ito (2006) demonstrate institutional quality has altering signs depending on the measures chosen and the dependent variables to be used. Our finding could therefore reinforce the argument that a threshold level of institutional and legal development is needed in order for countries to benefit from financial openness.

The results of the diagnostic tests show that in all cases the first order serial autocorrelation is rejected and the second order is accepted. The Sargan test, on the other hand, cannot reject the null hypothesis in all cases.

Our results are in line with those of the literature. Our initial findings highlight the link between financial openness and bond market development.

1.5.2 Results using coefficient of variation type indices

Table 1.4 (b) reports financial openness index to be significant for all dependent variables however the coefficients are positive only when the stock market development and financial development indices are used as dependent variables. Trade openness is found to be positively significant for all indices. Logarithm of GDP per capita is positive and significant for all cases with the exception of the bond market development index. Secondary school enrollment rate enters with negatively significant coefficient for all cases with the exception of the bond market development index whereas the institutional quality index is negative and significant for all cases. Similarly the first order serial correlation is rejected in all cases and the Sargan test cannot reject the null hypothesis of over-identification for all cases.

1.5.3 Results using principal component analysis type indices

Results using first score principal components[16]

[15] Huang (2006) finds the equally weighted financial openness index to be significant for banking sector, stock market and overall financial development. Baltagi, Demetriades and Law (2007) show that for individual measures of banking sector development, financial openness index of total foreign assets and liabilities (% of GDP) is positive and significant only when private credit, domestic credit, and liquid liabilities are used as measures of banking sector development. Baltagi, Demetriades and Law (2009) find the financial openness measures of Lane and Milesi-Ferretti, and Abiad and Mody, and the capital account openness index of Chinn and Ito to be significant for both private credit to GDP and stock market capitalization.

[16] We initially verify that the individual variables used in our indices are correlated. Our results show that we have positive correlations among individual variables.

The results for the first principal component of financial openness, in Table 1.3 (a), show that this component captures 47.77 % - 62.94 % of the total variation of individual measures depicted in terms of eigenvectors.[17] First component type financial openness index is shown to capture 76.98 % of the entire variance of three individual indicators of financial openness. Since most of these variables have similar eigenvectors constructing an index of financial openness using the first principal component measure yields accurate and sensible results (Huang, 2006). Given similar weights expressed by the eigenvectors using any single measure to study the impact of financial openness on financial development would bias our results. We thereby use the first principal component to score a proper and an efficient index for financial openness. Similarly the results of the principal component analysis for banking sector development in Table 1.3 (b) show that the first principal component of banking sector development captures 28.03% - 48.94 % of the total variation of individual measures. The index summarizes 72.77% of the variance of 5 individual indicators of the banking sector.

The results of principal components analysis on bond market development depicted in Table 1.3 (c) show that the first component explains 67.26% of the total variation of the two individual indicators. Since the number of individual variables forming this index is relatively small we are assured that the first component will be sufficient in capturing total effects of the principal component analysis.

The first principal component of stock market development in Table 1.3 (d) is found to capture 48.64% - 68.59 % of the total variation of individual measures. PCSMD, the first component of stock market development index, overall, accounts for 65.57% of the entire variance of 3 individual indicators of the stock market development.

Lastly Table 1.3 (e) shows that the first principal component of the financial development index explains 50.82% of the total variation of the 10 variables that construct banking sector, stock market and bond market development indices. The eigenvectors of the first principal component of financial development are positive, capturing 12.18 % - 41.04 % of the total variation of individual measures.

For the institutional quality index we score the first principal component of government effectiveness, regulatory quality, rule of law, and control of corruption. The variance explained by the first component is 95.90% as shown in Table 1.3 (f). The eigenvectors range between 49.35% - 50.41%.

The results strongly verify our choice for principal component type indices for financial openness, banking sector, bond and stock market, financial development and institutional quality. The examination of the eigenvectors portrays that the use of individual variables to examine the link between financial openness and financial development would potentially lead to selection bias.

Table 1.4 (c) depicts our findings for first score principal component indices. The results show that the financial openness index is significant in all cases with the exception of the bond market development index. Likewise trade openness is positive and significant for all dependent variables. This could mean that trade openness affects the development of bond markets whereas financial openness does not have a significant effect on the overall enhancement of bond markets.

Control variables of institutional quality and secondary school enrollment rate are mostly significant however with differing magnitudes. Secondary school enrollment rate enters with a positive coefficient in two out of four cases, whereas institutional quality is found to be negatively significant for all cases. The

[17] The total variation here refers to the maximal amount of variation in all three observed variables.

diagnostics are satisfactory for all dependent variables used. The absence of first order serial correlation is rejected and the Sargan test results cannot reject the over-identification restrictions.[18]

Overall, our findings show that there is a significant link between financial openness and financial development when both measures are constructed using first score of principal components. The results also demonstrate that the link between financial openness and financial development becomes more comprehensible with first score indices in comparison to equally weighted and coefficient of variation type indices.[19]

Results using principal components that take into account information from all components

The results in Table 1.4 (d) indicate that the financial openness index is significant for all dependent variables. Trade openness is also positively significant for all cases. Logarithm of GDP per capita is significant for all cases with the exception of the bond market development index. First order serial autocorrelation tests are rejected, while the Sargan test of over-identification cannot reject the null hypothesis in all cases.

Our results convey that using further components in our indices depicts similar findings for the link between financial openness and financial development. Due to the similarity of the results with both types of principal component indices, it is difficult to identify one methodology as the ideal procedure in constructing indices. In this context we choose the index measure that maximizes the goodness of fit of the linear model that we have studied between financial openness and financial development. Further examination of Tables 1.4 (c) and (d) conveys that while first score indices depict higher significances in terms of t-statistics, this methodology of principal components provides better results in terms of magnitudes and interpretations. We thereby use this methodology in reporting the rest of our results.

1.5.4 Adding the interaction term

Findings from Table 1.5 which include the interaction term show that the effects of financial and trade openness indices are positive and significant for all dependent variables. Logarithm of GDP per capita is positive and significant for all dependent variables with the exception of the bond market development index. The institutional quality index is negatively significant for banking sector, bond and stock market development and positively significant for financial development whereas secondary school enrollment rate is positively significant for three dependent variables. The interaction term between financial and trade openness is significant in three out of four cases with changing magnitudes. It is positive and significant for the banking sector development index, whereas it is negative and significant for bond and stock market development indices. This finding implies that a simultaneous opening of financial and goods markets leads to a decline in bond and stock market development rates. This could potentially be the result of the effects of financial openness and trade openness being picked up separately by each variable and not by the interaction term. Our results however agree with those of the literature. Baltagi, Demetriades and Law (2007) find the interaction term to be statistically significant together with financial and trade openness.[20]

[18] Huang (2006) reports similar results to our initial estimations. He finds financial openness index constructed using the first principal components to be positive and significant for stock market, banking sector and financial development.

[19] One pitfall is that the link between financial openness and bond market development disappears as in the case with equally weighted indices.

[20] Using banking sector development measures as dependent variables, the authors find the interaction term to be significant and negative for private credit, liquid liabilities and domestic credit.

Law and Demetriades (2006) show the interaction term, trade openness and capital account openness to be positively significant for stock market development.

1.6 Robustness checks and further issues

We carry out a large number of robustness checks in order to examine the sensitivity of our results to alternative specifications and methods. Here, we only report some robustness checks. Below we discuss the results when heterogeneity is taken under examination.

1.6.1 Robustness checks

The first set of robustness checks highlights the importance of the number of observations used in our analysis. Due to the data availability, some indices include a larger number of variables in comparison to others. Equating the number of observations for each dependent variable used in our estimations Table 1.6 depicts similar results to those of Table 1.4 (d). When the number of observations for each regression is equalized only minor changes occur.

Secondly we examine whether the exclusion of control variables of secondary school enrollment rate and institutional quality index affect our proposed model. The exclusion of institutional quality index from our regressions, not reported here[21], does not affect our initial findings. Similarly exclusion of the secondary school enrollment rate causes trade openness to lose significance for some dependent variables. These results show that even though the exclusion of institutional quality does not remarkably change our results, the exclusion of secondary school enrollment rate does. We thereby, stress the importance of including both of these control variables in our analysis to examine the link between financial openness and financial development.

Further tests regarding the structure of the variables have been considered. In order to account for the fact causality might be driving the results between financial openness and financial development we run robustness checks to examine the simultaneity and the endogeneity issues. Treating all right hand side variables as predetermined does not alter our main findings. With predetermined variables we find that trade openness enters with a negative coefficient when banking sector and bond market development indices are used as dependent variables. Similarly treating financial and trade openness as predetermined variables does not change our findings. Treating openness variables as endogenous we find similar results to those reported in Table 1.4 (d). This thereby confirms that the assumption of treating right hand side regressors as exogenous variables is not a restrictive one for this analysis.[22]

Another important issue concerns the time series versus cross sectional effects. Due to the twelve year period selected in our model we believe that there may be time series effects that are not picked up by our one lag structure. In order to account for these effects we estimate a higher lag model to observe the sensitivity of our findings to different lag structures. Table 1.7 depicts the results when three lags of the dependent variable are used as right hand side regressors and three lags of variables other than the dependent variable are used as instruments. The results show that adding further lags does not change our results. With further lags being used both as right hand side regressors and as instruments we find trade

[21] The table of results for the exclusion of institutional quality index and secondary school enrollment rate are not reported here. The results are available in the Supplementary Appendix, Table 1.1.2.

[22] The results for variables being treated as predetermined and endogenous can be found in the Supplementary Appendix, Tables 1.1.3 and 1.1.4.

openness to be insignificant for banking sector development index and negatively significant for the bond market development index. Using other lag specifications and allowing for dependent variables to be used as instruments does not change our main findings. Our analysis with higher lags demonstrates that the qualitative nature of our results is robust to alternative specifications and estimation methods.

We finally explore whether our benchmark results change when we consider not only time series effects but also cross sectional effects in our model. In order to observe the changes we add time series dummies and a country-specific time trend to account for differences across countries. The results are depicted in Table 1.8.[23] The results show that financial openness is no longer significant for banking sector and bond market development indices and trade openness is only significant for stock and bond market development. Logarithm of GDP per capita enters with negative signs in all cases.

On a final note we examine the results when we alter the methods used in the estimation process. With a fixed effects model that includes country and year effects we find financial openness to be positive and significant for two dependent variables. The principal components type financial openness index is no longer found to be significant for the bond and the stock market. Control variables of trade openness, logarithm of GDP per capita, institutional quality and secondary school enrollment are not as significant as in our benchmark case. High R-squares reported in the fixed effects model should not be misleading; the fixed effects estimator is biased when a lagged dependent variable is included in the estimations. Similarly, coefficients losing significances calls for an intricate model that can account for panel effects.[24]

1.6.2 Further issues

Heterogeneity problems

The use of developing and advanced countries together can create a drawback to our estimated model. Even though having a large number of observations in a joint sample leads to more efficient results we may not be able to fully differentiate whether the effects of financial openness on financial development follow due to the influence of advanced economies. In order to avoid complications and to clarify issues on heterogeneity we split our data set into developing and advanced countries and examine the results when the developing country sample is used in estimations.[25]

The developing country sample includes 31 countries over the twelve year period. The findings from Table 1.9 show that financial openness is positive and significant for banking sector, stock and bond market and financial development indices. The results are similar to those reported in Table 1.4 (d) in terms of sign and significance; however, trade openness, institutional quality and secondary school enrollment depict different magnitudes of coefficients. The results, overall, confirm that we do not have an endogeneity problem that is not explicitly recognized by our estimation methods. The link between financial openness and financial development follows even when a subsample of developing countries is used in our analysis. This strengthens the argument regarding the importance of opening up financial markets so as to enhance banking sector, bond and stock markets in developing countries.

[23] For a full set of results with time dummies and the linear trend, and time dummies please see the Supplementary Appendix,Tables 1.1.5 and 1.1.6.

[24] The results for the fixed effects estimations are available in the Supplementary Appendix, Table 1.1.11.

[25] We rely on the World Bank's income group definition when splitting our data set into developing and advanced countries.

We hereby reveal that financial openness influences financial development in both developing and advanced countries. Having shown that the discrepancies among countries in terms of financial development might arise as a result of not fully opening up financially, we leave the analysis of financial openness, economic growth and welfare to another study.

Additional results

To compare our results with earlier studies we run a series of regressions. To provide a better understanding of the effectiveness of our de facto type principal component indices we first present our results with de jure type capital account openness index of Chinn and Ito. Chinn and Ito's capital account openness index is constructed using four binary dummy variables which represent restrictions on financial transactions across countries as reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (Baltagi, Demetriades and Law, 2009). The four binary variables (existence of multiple exchange rates, restrictions on current account, capital account transactions, and a variable for export proceeds) are summarized in an index using the first score of principal components (Chinn and Ito, 2006). Table 1.10 depicts results with our principal component type development indices and the Chinn and Ito index of capital account openness. Capital account openness index is found to be significant for banking sector and stock market development indices and negatively significant for bond market and financial development indices. These findings, which are different from our benchmark model of Table 1.4 (d), imply that the removal of restrictions from capital accounts and the allowance of capital movements across countries have a negative impact on bond market and overall financial development. It is interesting to note that the diagnostics fail to compete with the ones reported in Table 1.4 (d). In three out of four cases first order serial correlation is rejected and the Sargan test cannot reject the null hypothesis of over-identification although the Sargan test values remain to be less powerful in comparison to those of the benchmark case.

To compare our previous results with the index measures to cases where a de facto type financial openness measure and individual financial development measures are used, we report estimations in Tables 1.11 and 1.12 using the Chinn and Ito capital account openness index, our financial openness index and individual measures of financial development most frequently used in the literature. Once again the findings demonstrate that the principal component index provides higher significances for not only financial openness but also for other control variables used in our model. Yet, in both cases the findings for the first order serial correlation test and the Sargan test are weaker in contrast to those from Table 1.4 (d). This is a result of the use of individual measures of financial development in comparison to indices. Although the use of de facto type measures may be limiting in terms of interpretations they help in resolving issues related to the simultaneity hypothesis. The results using the discrete de facto type financial openness index shows that the link goes in the direction of financial openness to financial development. Given that our index measures are stronger in terms of robustness, statistical significances and interpretations in comparison to the de facto measures which help resolve causality issues, we strongly believe that our indices also carry this property. Our previous results using endogenous financial openness indices depict similar results to our benchmark regressions providing evidence that a causality issue is not undermining our analysis.

Additionally we estimate our model with individual financial openness and financial development measures. The findings suggest mixed results.[26] Depending on the choice of financial development measures, the three indicators of financial openness; foreign direct investment (% of GDP), international debt issues (% of GDP) and portfolio investment (% of GDP) alter signs. Comparisons to the literature should be taken with caution

[26] Please refer to the Supplementary Appendix for these tables (Tables 1.1.9 (a), (b) and (c)).

due to a variety of reasons. Both models used in estimations and the choice of years and countries widely differ across studies.

Chinn and Ito (2006) find their index of capital account openness to be positive and significant for private credit which agrees with our results. Baltagi, Demetriades and Law (2007) depict the Chinn and Ito index of capital account openness to be significant for logarithm of private credit and stock market capitalization. The findings for the control variables of logarithm of GDP per capita and trade openness match with our results. The authors also show that the capital account openness index of Chinn and Ito has a negatively significant coefficient when the number of countries used in the estimation process has been reduced. This finding corresponds to our results.

Lastly we check the results when individual financial openness measures of foreign direct investment, international debt issues and portfolio investment are regressed against principal component type indices for financial development. Findings from the Supplementary Appendix[27] suggest that foreign direct investment is positive and significant for all dependent variables of principal component type indices with the exception of the bond market, whereas international debt issues is positive and significant in all cases, and portfolio investment is positive and significant for stock market and overall financial development indices and negatively significant for the banking sector and bond market development indices. This supports our earlier argument on the choice of financial openness measures affecting the results. Using individual measures as dependent variables for financial development, or using individual variables as measures of financial openness (both de facto and de jure type individual measures) we cannot find the clear link that we observe between financial openness and financial development whilst using indices. The results clearly demonstrate that depending on the variables chosen, the relationship between financial openness and financial development alters. Nevertheless using principal components indices we can unmistakably find a positive link between financial openness and financial development which is robust to different lag structures, estimation techniques and subsamples.

Partial effects and possible policy implications

To calculate the total effect of opening up goods and financial markets we use partial derivatives of banking sector, bond and stock market and overall financial development with respect to trade and financial openness. Recalling Model (b) in equation (2) we evaluate the partial derivates of financial development with respect to trade and financial openness as:

$$\frac{\partial FD_{it}}{\partial TO_{it}} = \lambda_1 + \lambda_5 FO_{it}$$
$$\frac{\partial FD_{it}}{\partial FO_{it}} = \lambda_1 + \lambda_5 TO_{it}$$

Baltagi, Demetriades and Law (2007, 2009) express that if both derivatives are positive then an increase in financial or trade openness will enhance financial development, whereas if financial (trade) markets are closed then the marginal effect of trade (financial) openness is expected to be non-positive. This proposition suggests that when one market is closed, there will be oppositions within countries to prevent financial development from advancing (Baltagi, Demetriades and Law, 2009).

[27] The results can be found in Tables 1.10 (a), (b) and (c).

Examining the results in Table 1.5 the partial derivative of the financial development index with respect to trade openness at the mean level of financial openness index is 0.006. The same partial derivative evaluated at the minimum level of financial openness index is 0.005, and evaluated at the maximum value is 0.006. Alternatively at the mean level of trade openness, the partial derivative of financial development index with respect to financial openness index is 0.482, 0.48 at the minimum level of trade openness and 0.489 at the maximum level of trade openness is 0.489.

Our findings show that both partial derivatives are positive even for the most closed economies implying that opening both trade and financial markets may have a large impact on overall financial development. However bond and stock market development indices have negative coefficients for the interaction term of financial and trade openness. Examining the partial derivatives for both bond and stock market development indices we find positive values.[28] Our results thereby suggest that a simultaneous opening could be beneficial in terms of banking sector, bond and stock markets and overall financial development. Nevertheless, possible implications of these results should be taken with great precaution.

We have shown that our principal component financial openness index influences banking sector, bond and stock market and overall financial development. We have demonstrated a clear positive link between financial openness and financial development using different lag structures, time dummies, models, and specifications. However, the results for the coefficients reported so far all represent short-run effects due to the presence of the lagged dependent variable in the models. In order to obtain long-run effects particularly for the financial openness index in Table 1.4 (d) we divide financial openness coefficients by $1 - \gamma$, where γ is the coefficient of the lagged dependent variable from our regressions. The findings show that the link between financial openness and development indices is positive even when examining the long-run coefficients.[29] The results suggest that the financial openness index has a clear impact on the long-run financial development index.

1.7 Concluding remarks

The literature has broadly focused on the link between financial liberalization and economic growth nevertheless the relationship between financial liberalization and financial development lacked a thorough discussion. Our goal has been to construct comprehensive indicators for both financial openness and financial development and analyze this link.

Using a panel data set of developing and advanced countries our results with aggregate indices with equal weights, coefficient of variation and two different principal component type methodologies show that the relationship between financial openness and financial development exists and that it is more significant than what the literature has previously acclaimed. Further examination of our benchmark results depict that the principal component indices with information from all components provide higher significances and more meaningful interpretations. In all estimations, independent of the development variables chosen, the

[28] The partial derivative of bond market development index with respect to trade openness when financial openness index is at its minimum is equal to 0.002, whereas for the stock market development index with respect to trade openness with the financial openness index at its minimum is equal to 0.011. Similarly partial derivatives of bond and stock market development indices with respect to financial openness when trade openness is held at its minimum value, are equal to 0.157 and 0.367 respectively.

[29] The long-run coefficient for financial openness using the banking sector development index is 0.643. The coefficients for financial openness using the bond and stock market development indices are 0.505 and 0.107 whereas for the overall financial development index it is 0.715.

principal component index of financial openness is found to be positive and significant. The addition of an interaction term, which questions whether the simultaneous opening of financial and goods markets have additional effects on financial development, brings intriguing results. Our findings show that the interaction term is positively significant for the banking sector development index and negatively significant for bond and stock market development indices. By breaking the sample into developing and advanced countries we confirm that the link between financial openness and financial development exists even for developing countries.

Comparisons with the literature stress the strength and effectiveness of our indices. Principal component type indices provide more robust and strong statistical conclusions on the link between financial openness and financial development. The partial derivatives and the long-run coefficients convey the positive link between financial openness and financial development validating our benchmark results.
On a last note, we have shown that using indices the link between financial openness and financial development is unambiguous. To this end, future work would call for a model that can provide theoretical underpinnings for the effects of financial openness on financial development.

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1.9 Appendix

Abbreviations

FO: *Financial openness index*
BD: *Banking sector development index*
BMD: *Bond market development index*
SMD: *Stock market development index*
FD: *Financial development index*
INSQUA: *Institutional quality index*
TO: *Trade openness measure*
LOGGDPPC: *Logarithm of GDP per capita*
SECSCHOOL: *Secondary school enrollment rate*
INTTERM: *Interaction term between financial and trade openness*

Table 1.1: Summary of the variables used in the analysis

Variable	Obs.	Mean	Std. Dev.	Min	Max
Financial Openness Indicators					
Foreign direct investment to GDP	653	13.192	71.824	-10.305	1095.3
International debt issues to GDP	719	19.902	24.886	0	210.68
Portfolio investment flows to GDP	699	0.9955	19.387	-24.785	311.84
Financial Development Indicators					
Banking Sector Development					
Liquid Liabilities to GDP	687	70.819	51.865	12.852	393.69
Private credit by domestic money banks and other financial institutions to GDP	708	71.228	49.476	4.7678	202.42
Deposit money bank assets to central bank and deposit money bank assets ratio	663	91.468	11.496	22.975	99.999
Total bank assets to GDP	642	82.393	47.929	12.418	257.47
Domestic credit provided by the banking sector	719	91.076	60.658	-72.994	313.49
Bond Market Development					
Private bond market capitalization to GDP	504	23.963	26.859	0	148.92
Public bond market capitalization to GDP	504	35.095	23.525	0.5474	159.91
Stock Market Development					
Stock market capitalization to GDP	730	68.240	66.006	2.0870	500.53
Stock market turnover ratio	731	58.759	66.569	0.1383	622.43
Stock market total value traded to GDP	730	46.491	65.769	0.0795	443.57
Control Variables					
Trade Openness	711	83.772	62.479	14.933	462.46
Logarithm of GDP per capita	732	8.664	1.4321	5.6921	10.937
Equally weighted institutional quality index	732	0.6342	0.9484	-1.3181	2.1633
Coefficient of variation type institutional quality index	732	0.6283	0.9613	-1.3394	2.1749
First component institutional quality index	732	-3.59e-09	1.9586	-4.0485	3.1597
Principal components institutional quality index	732	-2.08e-09	1.8783	-3.8859	3.0306
Secondary school gross enrollment rate	596	88.663	26.891	19.232	161.66
Interaction term (equally weighted financial openness index)	608	1847.3	10355.7	-760.989	143629.1
Interaction term (coefficient of variation type financial openness index)	608	989.78	8789.82	-4005.31	125179.3
Interaction term (first component financial openness index)	608	33.774	421.10	-196.817	6023.6

Interaction term (principal components financial openness index)	608	31.503	327.88	-128.265	4689.3
Aggregate Financial Openness Indicators					
Equally weighted financial openness index	627	12.085	36.155	-7.3472	507.54
Coefficient of variation type financial openness index	627	4.7093	30.524	-16.324	465.46
First component financial openness index	627	-1.17e-09	1.5197	-1.1943	20.337
Principal components financial openness index	627	0.0406	1.2257	-0.9813	14.913
Aggregate Financial Development Indicators					
Equally weighted banking sector development index	626	79.174	36.763	18.820	218.42
Equally weighted bond market development index	504	29.529	20.682	0.9429	99.349
Equally weighted stock market development index	730	57.855	53.003	2.7759	340.99
Equally weighted financial development index	441	70.314	32.587	15.967	170.89
Coefficient of variation type banking sector development index	626	77.359	40.313	17.026	232.38
Coefficient of variation type bond market development index	504	28.129	21.497	0.7058	103.39
Coefficient of variation type stock market development index	730	56.454	54.016	2.4331	341.69
Coefficient of variation type financial development index	441	65.964	35.554	10.034	191.89
First component type banking sector development index	626	-1.11e-09	1.9075	-3.8257	6.9987
First component type bond market development index	504	-9.38e-10	1.1598	-1.6291	4.1419
First component type stock market development index	730	5.87e-10	1.4025	-1.4081	7.8323
First component type financial development index	441	-1.26e-09	2.2544	-4.2956	5.9264
Principal components banking sector development index	626	-0.0769	1.3031	-3.4472	4.3389
Principal components bond market development index	504	-1.58e-09	0.8238	-0.9753	3.2082
Principal components stock market development index	730	0.0006	0.9619	-0.9404	5.7544
Principal components financial development index	441	0.2194	1.1417	-1.9449	3.3456

***Notes**:* The data above is for the period of 1996 – 2007. The countries used in this analysis are as follows: Argentina, Australia, Austria, Belgium, Bangladesh, Brazil, Barbados, Botswana, Canada, Switzerland, Chile, China, Cote d'Ivoire, Colombia, Cyprus, Germany, Denmark, Egypt, Spain, Finland, France, U.K., Ghana, Greece, Hong Kong, Hungary, Indonesia, India, Israel, Italy, Jamaica, Jordan, Japan, Kenya, Republic of Korea, Sri Lanka, Luxembourg, Morocco, Mexico, Mauritius, Malaysia, Nigeria, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, Poland, Portugal, Russian Federation, Saudi Arabia, Singapore, Sweden, Thailand, Trinidad and Tobago, Tunisia, Turkey, U.S., Venezuela, South Africa.

Table 1.2 (a): Pairwise correlations between equally weighted indices and control variables

Variables	FO	BD	BMD	SMD	FD	INSQUA	TO	LOGGDP	SECSC~	INTTERM
FO	1.0000									
BD	0.2977*	1.0000								
BMD	0.3257*	0.6164*	1.0000							
SMD	0.0674	0.5725*	0.2768*	1.0000						
FD	0.3811*	0.9030*	0.6818*	0.8107*	1.0000					
INSQUA	0.2486*	0.6960*	0.5228*	0.4723*	0.6455*	1.0000				
TO	0.3653*	0.2065*	0.0446	0.2560*	0.2173*	0.3064*	1.0000			
LOGGDP~	0.2713*	0.5975*	0.6126*	0.4350*	0.6184*	0.8048*	0.2388*	1.0000		
SECSC~	0.1360*	0.4804*	0.4464*	0.3127*	0.3118*	0.7705*	0.0599	0.6836*	1.0000	
INTTERM	0.9829*	0.1834*	0.2028*	0.0350	0.2960*	0.1840*	0.4013*	0.1989*	0.0574	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, EFO = Equally weighted financial openness index, BD = Equally weighted banking sector development index, BMD = Equally weighted bond market development index, SMD = Equally weighted stock market development index, FD = Equally weighted financial development index, INTTERM = Equally weighted interaction term between financial and trade openness, TO = Trade openness variable, INSQUA = Equally weighted institutional quality index.

Table 1.2 (b): Pairwise correlations between coefficient of variation type indices and control variables

Variables	FO	BD	BMD	SMD	FD	INSQUA	TO	LOGGDP	SECSC~	INTTERM
FO	1.0000									
BD	0.1235*	1.0000								
BMD	0.1354*	0.6250*	1.0000							
SMD	-0.0247	0.5651*	0.3239*	1.0000						
FD	0.1237*	0.8218*	0.6491*	0.8924*	1.0000					
INSQUA	0.1391*	0.6900*	0.5518*	0.4613*	0.6056*	1.0000				
TO	0.3018*	0.2075*	0.0584	0.2289*	0.1951*	0.3026*	1.0000			
LOGGDP~	0.1581*	0.5950*	0.6289*	0.4306*	0.5777*	0.8041*	0.2388*	1.0000		
SECSC~	0.0491*	0.4695*	0.4481*	0.3076*	0.2740*	0.7693*	0.0599	0.6836*	1.0000	
INTTERM	0.9930*	0.0957*	0.0862	-0.0244	0.0703	0.1324*	0.3112*	0.1506*	0.0301	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, FO = Coefficient of variation type financial openness index, BD = Coefficient of variation type banking sector development index, BMD = Coefficient of variation type bond market development index, SMD = Coefficient of variation type stock market development index, FD = Coefficient of variation type financial development index, INTTERM = Coefficient of variation type interaction term between financial and trade openness, TO = Trade openness variable, INSQUA = Coefficient of variation type institutional quality index.

Table 1.2 (c): Pairwise correlations between first score indices and control variables

Variables	FO	BD	BMD	SMD	FD	INSQUA	TO	LOGGDP	SECSC~	INT~
FO	1.0000									
BD	0.3226*	1.0000								
BMD	0.3246*	0.6013*	1.0000							
SMD	0.0689	0.5776*	0.2682*	1.0000						
FD	0.3926*	0.9616*	0.6989*	0.6864*	1.0000					
INSQUA	0.2576*	0.7097*	0.5105*	0.4785*	0.6971*	1.0000				
TO	0.3416*	0.2191*	0.0406	0.2642*	0.2489*	0.3090*	1.0000			
LOGGDP~	0.2811*	0.5978*	0.6050*	0.4426*	0.6795*	0.8050*	0.2388*	1.0000		
SECSC~	0.1526*	0.4989*	0.4436*	0.3135*	0.3778*	0.7703*	0.0599	0.6836*	1.0000	
INTTERM	0.9761*	0.1684*	0.2907*	0.0067*	0.2904*	0.1650*	0.3101*	0.1854*	0.0590	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, FO = First score principal components type financial openness index, BD = First score principal components type banking sector development index, BMD = First score principal components type bond market development index, SMD = First score principal components type stock market development index, FD = First score principal components type financial development index, INTTERM = First score principal components type interaction term between financial and trade openness, TO = Trade openness variable, INSQUA = First score principal components type institutional quality index.

Table 1.2 (d): Pairwise correlations between principal components (information from all components methodology) type indices and control variables

Variables	FO	BD	BMD	SMD	FD	INSQUA	TO	LOGGDP	SECSC~	INTTERM
FO	1.0000									
BD	0.3707*	1.0000								
BMD	0.3338*	0.6110*	1.0000							
SMD	0.0617	0.4912*	0.3336*	1.0000						
FD	0.4061*	0.8912*	0.7783*	0.7054*	1.0000					
INSQUA	0.3176*	0.7243*	0.5584*	0.3946*	0.6761*	1.0000				
TO	0.3543*	0.2162*	0.0668	0.1072*	0.2052*	0.3097*	1.0000			
LOGGDP~	0.3444*	0.5921*	0.6299*	0.3742*	0.6711*	0.8050*	0.2388*	1.0000		
SECSC~	0.2091*	0.5271*	0.4419*	0.2792*	0.3644*	0.7701*	0.0599	0.6836*	1.0000	
INTTERM	0.9567*	0.2117*	0.2899*	-0.0208	0.3367*	0.1902*	0.3323*	0.2101*	0.0779	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, PCAFO = Principal components type financial openness index, BD = Principal components type banking sector development index, BMD = Principal components type bond market development index, SMD = Principal components type stock market development index, FD = Principal components type financial development index, INTTERM = Principal components type interaction term between financial and trade openness, TO = Trade openness variable, INSQUA = Principal components type institutional quality index.

Table 1.3 (a): Summary of Principal Component Analysis for the Financial Openness Index

Variables	Eigenvectors		
	PC1	*PC2*	*PC3*
FDI (% of GDP)	0.6294	-0.2744	-0.7270
International debt issues (% of GDP)	0.4777	0.8745	0.0836
Portfolio flows (% of GDP)	0.6128	-0.3999	0.6815
Eigenvalues	2.30949	0.617696	0.0728145
Cumulative Proportions:	0.7698	0.9757	1.0000
Number of observations: 627			
Number of components: 3			
Weights for variables*:	0.410387	0.549835	0.405954
Weights for variables:**	0.447601	0.38914	0.039879

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (information from all components methodology) type indices. * represents the weights for the entire sample respectively for FDI, international debt issues and portfolio investment while ** represents the weights for these variables in the same order for the developing country sample.*

Table 1.3 (b): Summary of Principal Component Analysis for the Banking Sector Development Index

Variables	Eigenvectors				
	PC1	*PC2*	*PC3*	*PC4*	*PC5*
Liquid liabilities (% of GDP)	0.4528	-0.1830	0.7837	0.2997	-0.2400
Private credit (% of GDP)	0.4875	0.0420	-0.5170	0.0826	-0.6975
Deposit bank assets	0.2803	0.9383	0.1194	-0.0350	0.1597
Total bank assets (% of GDP)	0.4892	-0.2163	0.0418	-0.8197	0.2008
Domestic credit (% of GDP)	0.4894	-0.1939	-0.3202	0.4799	0.6246
Eigenvalues	3.6386	0.802872	0.342941	0.130476	0.0851069
Cumulative Proportions:	0.7277	0.8883	0.9569	0.9830	1.0000
Number of observations: 626					
Number of components: 5					
Weights for variables*:	0.357615	0.316331	0.364641	0.306163	0.326203
Weights for variables:**	0.36642	0.341067	0.337296	0.326477	0.311329

***Notes**: PC denotes the principal components of each individual variable. Deposit bank assets: Deposit money bank assets to the sum of central bank assets and deposit money bank assets. Weights for variables represent the weights used in constructing principal components (information from all components methodology) type indices. * represents the weights for the entire sample respectively for liquid liabilities, private credit, deposit money bank assets to the sum of central bank assets and deposit money bank assets, total bank assets, and domestic credit while ** represents the weights for these variables in the same order for the developing country sample.*

Table 1.3 (c): Summary of Principal Component Analysis for the Bond Market Development Index

Variables	Eigenvectors	
	PC1	*PC2*
Private bond market capitalization (% of GDP)	0.7071	0.7071
Public bond market capitalization (% of GDP)	0.7071	- 0.7071
Eigenvalues	1.3451	0.6549
Cumulative Proportions:	0.6726	1.0000
Number of observations: 504		
Number of components: 2		
Weights for variables*:	0.7071	0.24402
Weights for variables:**	0.707099	0.150402

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (information from all components methodology) type indices.* represents the weights for the entire sample respectively for private bond market capitalization and public bond market capitalization while **represents the weights for these variables in the same order for the developing country sample.*

Table 1.3 (d): Summary of Principal Component Analysis for the Stock Market Development index

Variables	Eigenvectors		
	PC1	*PC2*	*PC3*
Stock market capitalization (% of GDP)	0.5412	-0.6568	0.5250
Stock market turnover ratio (in percentages)	0.4864	0.7538	0.4417
Stock market total value traded (% of GDP)	0.6859	-0.0163	-0.7275
Eigenvalues	1.96712	0.892612	0.140268
Cumulative Proportions:	0.6557	0.9532	1.0000
Number of observations: 730			
Number of components: 3			
Weights for variables*:	0.183993	0.563871	0.410884
Weights for variables:**	0.165746	0.550619	0.401326

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (information from all components methodology) type indices. * represents the weights for the entire sample respectively for stock market capitalization, stock market turnover ratio and stock market total value traded while ** represents the weights for these variables in the same order for the developing country sample.*

Table 1.3 (e): Summary of Principal Component Analysis for the Financial Development Index

Variables	Eigenvectors									
	PC1	*PC2*	*PC3*	*PC4*	*PC5*	*PC6*	*PC7*	*PC8*	*PC9*	*PC10*
Liquid liabilities (% of GDP)	0.3720	-0.2704	0.0570	-0.2052	-0.3816	0.0306	0.3840	-0.0594	0.5541	-0.3722
Private credit (% of GDP)	0.4104	0.0189	-0.1464	0.0798	-0.0399	-0.2824	-0.4926	-0.0913	-0.3125	-0.6110
Deposit bank assets	0.2246	-0.0059	-0.4402	0.7114	-0.1708	0.4460	-0.0019	-0.0258	0.0882	0.1144
Total bank assets (% of GDP)	0.3870	-0.2453	-0.0032	-0.0503	-0.3072	-0.1891	0.3383	0.3163	-0.5781	0.3297
Domestic credit (% of GDP)	0.4092	-0.1736	0.0789	-0.1110	0.0140	-0.1785	-0.4777	-0.2876	0.3067	0.5889
Private bond market~	0.3026	0.0792	0.1332	0.3788	0.6392	-0.4006	0.3369	0.1469	0.1904	-0.0242
Public bond market~	0.2013	-0.3744	0.5442	0.0120	0.3120	0.6014	-0.1066	0.0204	-0.1935	-0.1217
Stock market~	0.2916	0.2609	-0.3952	-0.4584	0.2710	0.2995	-0.1135	0.5361	0.1278	0.0285
Stock market turnover~	0.1218	0.5728	0.5523	0.1992	-0.3808	0.0146	-0.1680	0.3496	0.1258	0.0302
Stock total value traded~	0.3058	0.5418	0.0157	-0.1927	0.0687	-0.2016	0.3182	-0.6108	-0.2312	0.0485
Eigenvalues	5.0823	1.35905	1.07573	0.784147	0.673569	0.588792	0.160829	0.12706	0.102543	0.04597
Cumulative Proportions:	0.5082	0.6441	0.7517	0.8301	0.8975	0.9564	0.9724	0.9851	0.9954	1.0000
Num. of obs.: 441										
Num. of components: 10										
Weights for variables*:	0.12784	0.167244	0.137605	0.13228	0.169106	0.23718	0.163332	0.14751	0.193161	0.22733
Weights for variables:**	0.18507	0.191976	0.183899	0.16247	0.19464	0.161879	0.155323	0.20263	0.12997	0.23771

***Notes**: PC denotes the principal components of each individual variable. Deposit bank assets: Deposit money bank assets to the sum of central bank assets and deposit money bank assets, Private bond market~: Private bond market capitalization (% of GDP), Public bond market~: Public bond market capitalization (% of GDP), Stock market~: Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock total value traded~: Stock market total value traded (% of GDP). Weights for variables represent the weights used in constructing principal components (information from all components methodology) type indices. * represents the weights for liquid liabilities, private credit, deposit money bank assets to the sum of deposit money bank assets and central bank assets, total bank assets, deposit money bank assets to central bank assets, domestic credit, private bond market capitalization, public bond market capitalization, stock market capitalization, stock market turnover ratio and stock market total value traded for the entire sample while ** represents the weights for these variables in the same order for the developing country sample.*

Table 1.3 (f): Summary of Principal Component Analysis for the Institutional Quality Index

Variables	Eigenvectors			
	PC1	*PC2*	*PC3*	*PC4*
Government effectiveness	0.5021	-0.2055	-0.7095	0.4498
Regulatory quality	0.4935	0.8576	0.1347	0.0533
Rule of law	0.5003	-0.4158	0.6839	0.3303
Control of corruption	0.5041	-0.2223	-0.1039	-0.8281
Eigenvalues	3.8359	0.0882176	0.0458957	0.0458957
Cumulative Proportions:	0.9590	0.9810	0.9925	1.0000
Number of observations: 732				
Number of components: 4				
Weights for variables*:	0.4722	0.494113	0.480928	0.471117
Weights for variables:**	0.432668	0.490725	0.43863	0.424311

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (information from all components methodology) type indices. * represents the weights respectively for government effectiveness, regulatory quality, rule of law and control of corruption for the entire sample while ** represents the weights for these variables in the same order for the developing country sample.*

Table 1.4 (a): Equally weighted financial development and financial openness indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.731***	0.887***	0.376***	0.311***
	(269.1)	(76.47)	(451.2)	(42.54)
	[0.00266]	[0.0116]	[0.000834]	[0.00731]
ΔFinancial openness	0.343***	0.005	0.136***	0.801***
	(31.67)	(0.713)	(21.43)	(21.13)
	[0.0108]	[0.00729]	[0.00635]	[0.0379]
ΔTrade Openness	0.024***	0.030***	0.712***	0.186***
	(4.133)	(5.885)	(112.4)	(16.90)
	[0.00575]	[0.00512]	[0.00633]	[0.0110]
ΔLog GDP per capita	3.422***	-3.614***	50.53***	14.24***
	(2.677)	(-3.845)	(36.19)	(17.80)
	[1.278]	[0.940]	[1.396]	[0.800]
ΔInstitutional Quality	-2.040***	-3.841***	-25.76***	0.542
	(-4.783)	(-5.017)	(-54.09)	(0.329)
	[0.427]	[0.766]	[0.476]	[1.650]
ΔSecondary School Enrollment	0.006**	0.008***	-0.239***	-0.041***
	(2.283)	(4.805)	(-16.42)	(-13.24)
	[0.00266]	[0.00171]	[0.0145]	[0.00308]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.07 Pr > z = 0.0381**	**z = -2.23 Pr > z = 0.0255**	**z = -1.96 Pr > z = 0.0500**	**z = -1.82 Pr > z = 0.0681**
Arellano – Bond test for AR(2) in first differences:	**z = -1.03 Pr > z = 0.3011**	**z = -1.48 Pr > z = 0.1395**	**z = -0.97 Pr > z = 0.3298**	**z = -1.16 Pr > z = 0.2445**

Sargan test:	**$Chi^2(54)$ = 48.43 Prob > chi^2 = 0.6883**	**$Chi^2(54)$ = 36.50 Prob > chi^2 = 0.9674**	**$Chi^2(54)$ = 51.02 Prob > chi^2 = 0.5901**	**$Chi^2(54)$ = 33.02 Prob > chi^2 = 0.9892**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. (The estimations use Stata's xtabond command). The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using equal weights in indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.4 (b): Coefficient of variation type financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.799***	0.883***	0.372***	0.296***
	(99.95)	(62.80)	(538.4)	(62.55)
	[0.00800]	[0.0141]	[0.000691]	[0.00474]
ΔFinancial openness	-0.021***	-0.0509***	0.102***	0.749***
	(-3.831)	(-7.189)	(8.597)	(38.82)
	[0.00548]	[0.00708]	[0.0119]	[0.0193]
ΔTrade openness	0.104***	0.0415***	0.775***	0.521***
	(17.46)	(5.303)	(115.7)	(31.22)
	[0.00595]	[0.00783]	[0.00670]	[0.0167]
ΔLog GDP per capita	4.875***	-3.427***	53.32***	21.21***
	(6.258)	(-2.770)	(46.46)	(14.45)
	[0.779]	[1.237]	[1.148]	[1.468]
Δ Institutional Quality	-6.319***	-5.337***	-27.96***	-11.94***
	(-65.43)	(-10.66)	(-49.14)	(-3.424)
	[0.0966]	[0.501]	[0.569]	[3.488]
ΔSecondary School Enrollment	-0.040***	0.0002	-0.264***	-0.149***
	(-4.041)	(0.194)	(-23.35)	(-24.93)
	[0.00989]	[0.000984]	[0.0113]	[0.00598]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -1.94 Pr > z =0.0522**	**z = -2.48 Pr > z = 0.0132**	**z = -2.07 Pr > z =0.0389**	**z = -1.86 Pr > z=0.0625**
Arellano – Bond test for	**z = -1.06**	**z = -1.67**	**z = -0.86**	**z = -1.11**

AR(2) in first differences:	**Pr > z =0.2897**	**Pr > z =0.0943**	**Pr > z=0.3913**	**Pr > z=0.2677**
Sargan test:	**$Chi^2(54)$ = 44.48 Prob > chi^2 = 0.8187**	**$Chi^2(54)$ = 33.37 Prob > chi^2 = 0.9878**	**$Chi^2(54)$ = 50.18 Prob > chi^2 = 0.6226**	**$Chi^2(54)$ = 31.77 Prob > chi^2 = 0.9932**

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed using the coefficient of variation methodology. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using coefficient of variation type indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.4 (c): First component type financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.854***	0.865***	0.367***	0.696***
	(89.51)	(98.65)	(321.8)	(62.75)
	[0.00954]	[0.00876]	[0.00114]	[0.0111]
ΔFinancial openness	0.146***	0.0025	0.0691***	0.540***
	(13.23)	(0.306)	(9.956)	(17.46)
	[0.0110]	[0.00830]	[0.00694]	[0.0310]
ΔTrade openness	0.0026***	0.0014***	0.0206***	0.0077***
	(4.536)	(2.672)	(82.39)	(8.007)
	[0.00581]	[0.000504]	[0.000250]	[0.000957]
ΔLog GDP per capita	0.0787	-0.368***	0.883***	0.587***
	(1.184)	(-12.32)	(16.70)	(12.36)
	[0.0665]	[0.0298]	[0.0528]	[0.0475]
ΔInstitutional Quality	-0.0696***	-0.0803***	-0.116***	-0.0004
	(-4.401)	(-20.10)	(-8.887)	(-0.00870)
	[0.0158]	[0.00400]	[0.0131]	[0.0502]
ΔSecondary School Enrollment	0.0007**	0.0013***	-0.007***	-0.0019***
	(2.223)	(5.595)	(-32.81)	(-3.102)
	[0.000309]	[0.000229]	[0.000206]	[0.000596]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for	**z = -2.22**	**z = -2.15**	**z = -2.06**	**z = -2.67**
AR(1) in first differences:	**Pr > z=0.0266**	**Pr > z =0.0313**	**Pr > z =0.0396**	**Pr > z=0.0075**
Arellano – Bond test for	**z = -1.36**	**z = -1.36**	**z = -0.91**	**z = -1.82**

AR(2) in first differences:	**Pr > z=0.1733**	**Pr > z=0.1726**	**Pr > z=0.3652**	**Pr > z=0.0692**
Sargan test:	**$Chi^2(54)$ = 47.26 Prob > chi^2 = 0.7300**	**$Chi^2(54)$ = 33.82 Prob > chi^2 = 0.9857**	**$Chi^2(54)$ = 49.02 Prob > chi^2 = 0.6666**	**$Chi^2(54)$ = 31.87 Prob > chi^2 = 0.9929**

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using first score of principal components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.4 (d): Principal components (information from all components methodology) type financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.847***	0.808***	0.230***	0.302***
	(84.07)	(60.21)	(309.8)	(80.46)
	[0.0101]	[0.0134]	[0.000741]	[0.00376]
ΔFinancial openness	0.0983***	0.0970***	0.0825***	0.499***
	(12.86)	(16.51)	(6.954)	(37.54)
	[0.00765]	[0.00588]	[0.0119]	[0.0133]
ΔTrade openness	0.0017***	0.00064***	0.0104***	0.0052***
	(4.218)	(6.969)	(55.70)	(9.015)
	[0.000397]	[0.000092]	[0.000187]	[0.000576]
ΔLog GDP per capita	0.131***	-0.147***	0.503***	0.477***
	(3.030)	(-6.496)	(19.32)	(9.976)
	[0.0431]	[0.00273]	[0.0260]	[0.0478]
ΔInstitutional Quality	-0.0088	-0.0551***	-0.106***	0.0359***
	(-1.378)	(-20.20)	(-13.01)	(5.299)
	[0.00638]	[0.00273]	[0.00812]	[0.00678]
ΔSecondary School Enrollment	0.0008***	0.00001	-0.0045***	0.0021***
	(4.181)	(0.274)	(-23.17)	(5.550)
	[0.000190]	[0.000120]	[0.000196]	[0.000386]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.47 Pr > z =0.0134**	**z = -2.39 Pr > z =0.0168**	**z = -1.90 Pr > z =0.0573**	**z = -1.99 Pr >z=0.0468**

Arellano – Bond test for AR(2) in first differences:	**z = -1.46 Pr > z =0.1435**	**z = -1.66 Pr > z=0.0974**	**z = -0.96 Pr > z=0.3386**	**z = -1.07 Pr >z=0.2854**
Sargan test:	**$Chi^2(54)$ = 42.13 Prob > chi^2 = 0.8795**	**$Chi^2(54)$ = 37.89 Prob > chi^2 = 0.9528**	**$Chi^2(54)$ = 44.36 Prob > chi^2 = 0.8222**	**$Chi^2(54)$ = 33.49 Prob > chi^2 = 0.9872**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indicess are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.5: Principal components type financial openness and financial development indices with an interaction term

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.848***	0.808***	0.239***	0.312***
	(66.15)	(59.66)	(161.4)	(31.20)
	[0.0128]	[0.0135]	[0.00148]	[0.0100]
ΔFinancial openness	0.0752***	0.170***	0.384***	0.480***
	(2.722)	(16.39)	(19.58)	(17.70)
	[0.0276]	[0.0104]	[0.0196]	[0.0271]
ΔTrade openness	0.0015***	0.0011***	0.0102***	0.0055***
	(3.667)	(6.581)	(70.19)	(9.982)
	[0.000416]	[0.000163]	[0.000146]	[0.000547]
ΔLog GDP per capita	0.149***	-0.131***	0.448***	0.486***
	(2.968)	(-4.972)	(13.12)	(7.235)
	[0.0502]	[0.0263]	[0.0341]	[0.0672]
ΔInstitutional Quality	-0.0172	-0.0439***	-0.0387**	0.0505***
	(-1.323)	(-11.81)	(-5.265)	(4.214)
	[0.0130]	[0.00372]	[0.00735]	[0.0120]
ΔSecondary School Enrollment	0.0009***	0.000135	-0.0031***	0.00234***
	(5.709)	(0.818)	(-9.851)	(7.839)
	[0.000162]	[0.000165]	[0.000316]	[0.000299]
ΔInteraction term	0.00035*	-0.00086***	-0.0012***	0.00002
	(1.907)	(-11.98)	(-23.99)	(0.0763)
	[0.000182]	[0.0000716]	[0.0000487]	[0.000282]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for	**z = -2.50**	**z = -2.38**	**z = -1.91**	**z = -2.03**

AR(1) in first differences:	**Pr > z =0.0126**	**Pr > z = 0.0175**	**Pr > z =0.0567**	**Pr > z=0.0424**
Arellano – Bond test for	**z = -1.47**	**z = -1.73**	**z = -1.00**	**z = -1.04**
AR(2) in first differences:	**Pr > z =0.1415**	**Pr > z =0.0844**	**Pr > z=0.3163**	**Pr > z=0.2990**
Sargan test:	**$Chi^2(54)$ = 47.62**	**$Chi^2(54)$ = 36.44**	**$Chi^2(54)$ = 47.84**	**$Chi^2(54)$ = 35.02**
	Prob > chi^2 = 0.7173	**Prob > chi^2 = 0.9680**	**Prob > chi^2 = 0.7096**	**Prob > chi^2 = 0.9790**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using principal component indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.6: Principal components type financial openness and financial development indices; Equal number of observations

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.843***	0.844***	0.1462***	0.302***
	(41.57)	(42.65)	(27.40)	(80.46)
	[0.0202678]	[0.0197798]	[0.005337]	[0.0037564]
ΔFinancial openness	0.0969***	0.0860***	0.4296***	0.4995***
	(8.00)	(13.19)	(21.70)	(37.54)
	[0.0121035]	[0.0065188]	[0.0197972]	[0.0133043]
ΔTrade openness	0.00105*	0.00022**	0.0138***	0.0052***
	(1.93)	(2.25)	(23.92)	(9.01)
	[0.0005445]	[0.0000996]	[0.0005775]	[0.0005763]
ΔLog GDP per capita	0.294***	-0.1366***	-0.0108	0.4771***
	(3.75)	(-8.42)	(-0.10)	(9.98)
	[0.0783096]	[0.0162171]	[0.1123693]	[0.0478278]
ΔInstitutional Quality	-0.0147	-0.0534***	0.0139	0.0359***
	(-0.67)	(-8.88)	(0.59)	(5.30)
	[0.0219016]	[0.0060153]	[0.0236854]	[0.0067846]
ΔSecondary School Enrollment	0.0012***	0.0008***	-0.0061***	0.0021***
	(7.03)	(7.54)	(-5.23)	(5.55)
	[0.0001671]	[0.0001072]	[0.0011695]	[0.0003861]
Number of observations:	**262**	**262**	**262**	**262**
Number of groups:	**38**	**38**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.11 Pr > z=0.0346**	**z = -2.06 Pr > z =0.0392**	**z = -1.71 Pr > z =0.0871**	**z = -1.99 Pr > z=0.0468**
Arellano – Bond test for AR(2) in first differences:	**z = -1.48 Pr > z=0.1384**	**z = -1.49 Pr > z=0.1369**	**z = -0.97 Pr > z=0.2396**	**z = -1.07 Pr > z=0.3333**

Sargan test:	**$Chi^2(54)$ = 34.72 Prob > chi^2 = 0.9808**	**$Chi^2(54)$ = 29.38 Prob > chi^2 = 0.9975**	**$Chi^2(54)$ = 33.04 Prob > chi^2 = 0.9891**	**$Chi^2(54)$ = 33.49 Prob > chi^2 = 0.9872**

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The indices are constructed following the principal component methodology that utilizes all components. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using principal component indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.7: Principal components type financial openness and financial development indices; Changing lag structure

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lag 1)	1.1399***	0.4776***	0.2363***	0.3271***
	(46.01)	(20.75)	(122.07)	(41.72)
	[0.0247731]	[0.0230098]	[0.0019359]	[0.0078403]
ΔDependent variable (Lag 2)	-0.3948***	-0.0416***	-0.1279***	-0.0764***
	(-20.27)	(-7.32)	(-49.68)	(-6.38)
	[0.019475]	[0.0056819]	[0.0025747]	[0.0119731]
ΔDependent variable (Lag 3)	0.1837***	0.3101***	-0.0491***	-0.1181***
	(19.97)	(57.05)	(-21.95)	(-10.58)
	[0.0092001]	[0.0054356]	[0.0022359]	[0.0111681]
ΔFinancial openness	0.0947***	0.1237***	0.0689***	0.476***
	(8.03)	(13.86)	(4.08)	(12.13)
	[0.01177981]	[0.0089279]	[0.168978]	[0.0392724]
ΔTrade openness	0.0004	-0.0003**	0.0131***	0.0057***
	(0.68)	(-2.42)	(67.50)	(6.82)
	[0.000539]	[0.0001152]	[0.0001944]	[0.0008389]
ΔLog GDP per capita	0.0569*	-0.0807***	-0.1367**	0.617***
	(1.90)	(-2.90)	(-2.22)	(3.62)
	[0.0299644]	[0.0278365]	[0.0616486]	[0.1706641]
ΔInstitutional Quality	-0.01106	-0.04822***	-0.2413***	-0.0129
	(-0.45)	(-18.95)	(-8.50)	(-0.50)
	[0.0246444]	[0.0025442]	[0.028378]	[0.0257977]
ΔSecondary School Enrollment	0.0004	-0.0016***	-0.0027***	0.0005
	(1.48)	(-11.62)	(-5.13)	(1.05)
	[0.0002368]	[0.0001344]	[0.0004416]	[0.0004206]
Number of observations:	**289**	**274**	**346**	**225**

Number of groups:	49	40	53	37
Arellano – Bond test for	z = -3.04	z = -1.40	z = -1.96	z = -1.96
AR(1) in first differences:	Pr > z =0.0024	Pr > z = 0.1628	Pr > z=0.0501	Pr >z=0.0498
Arellano – Bond test for	z = 0.67	z = 1.03	z = 1.38	z = 1.11
AR(2) in first differences:	Pr > z =0.5006	Pr > z =0.3012	Pr >z=0.1689	Pr >z=0.2668
Sargan test:	$Chi^2(49)$ = 44.27 Prob > chi^2 = 0.6650	$Chi^2(49)$ = 32.75 Prob > chi^2 = 0.9640	$Chi^2(49)$ = 47.93 Prob > chi^2 = 0.5165	$Chi^2(49)$ = 31.29 Prob > chi^2 = 0.9771

Notes: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with 3 lags of the dependent variable to be included in the model, 0 lags of the dependent variable and 3 lags of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The indices are constructed following the principal component methodology that utilizes all components. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using principal component indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.

Table 1.8: Principal component type financial openness and financial development indices with time dummies and a trend

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.8478***	0.768***	0.1741***	0.3197***
	(48.95)	(23.53)	(27.61)	(13.36)
	[0.0173202]	[0.326304]	[0.0063054]	[0.023957]
ΔFinancial openness	-0.0304	0.0009	0.0832**	0.3778***
	(-1.38)	(0.09)	(2.52)	(9.68)
	[0.0219826]	[0.0101114]	[0.0329683]	[0.0390382]
ΔTrade openness	0.0005	0.0007*	0.0049***	0.0002
	(0.83)	(1.75)	(7.38)	(0.12)
	[0.0005959]	[0.0003802]	[0.0006743]	[0.0016972]
ΔLog GDP per capita	-0.8265***	-0.6568***	-0.6226*	-1.0856***
	(-5.26)	(-8.20)	(-1.68)	(-2.69)
	[0.1572273]	[0.0800554]	[0.3716739]	[0.4041233]
ΔInstitutional Quality	0.0006	-0.0219**	-0.0964**	0.1053**
	(0.03)	(-2.28)	(-2.60)	(2.34)
	[0.017873]	[0.0095802]	[0.0370737]	[0.0450465]
ΔSecondary School Enrollment	0.0016***	0.0012***	-0.0041***	0.0024*
	(3.11)	(3.13)	(-3.28)	(1.69)
	[0.0005091]	[0.003713]	[0.0012646]	[0.0014215]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for	**z = -2.27**	**z = -2.52**	**z = -1.85**	**z = -2.10**
AR(1) in first differences:	**Pr > z=0.0231**	**Pr > z = 0.0116**	**Pr > z=0.0642**	**Pr > z=0.0357**
Arellano – Bond test for	**z = -1.51**	**z = -1.18**	**z = -1.20**	**z = -1.10**
AR(2) in first differences:	**Pr > z=0.1314**	**Pr > z =0.2383**	**Pr >z=0.2318**	**Pr > z=0.2733**
Sargan test:	**$Chi^2(54)$**	**$Chi^2(54)$**	**$Chi^2(54)$**	**$Chi^2(54)$**

	= 31.23 Prob > chi^2 = 0.9945	= 25.78 Prob > chi^2 = 0.9996	= 45.95 Prob > chi^2 = 0.7740	= 22.67 Prob > chi^2 = 0.9999

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.9: Principal components type financial openness and financial development indices for the developing country sample

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.809***	0.5387***	0.2234***	0.414***
	(31.16)	(14.27)	(31.09)	(5.07)
	[0.0259655]	[0.0377382]	[0.0071859]	[0.0816462]
ΔFinancial openness	0.0334**	0.0055	0.0941***	0.1138***
	(2.09)	(0.56)	(6.28)	(4.94)
	[0.0160238]	[0.0098091]	[0.0149839]	[0.0230477]
ΔTrade openness	-0.0018**	-0.0013***	0.0118***	0.0029*
	(-2.55)	(-3.16)	(16.48)	(1.70)
	[0.0006937]	[0.0004178]	[0.0007136]	[0.0016757]
ΔLog GDP per capita	0.5396***	0.0541	0.3992**	0.7263***
	(3.98)	(0.57)	(2.42)	(5.81)
	[0.1357218]	[0.0943717]	[0.1648696]	[0.1250271]
ΔInstitutional Quality	0.0038	-0.2643***	-0.072***	-0.1168***
	(0.32)	(-18.88)	(-3.11)	(-3.32)
	[0.0119641]	[0.0140001]	[0.0231092]	[0.0351751]
ΔSecondary School Enrollment	-0.0029	0.0048***	-0.006***	-0.0015
	(-1.58)	(6.39)	(-5.44)	(-0.76)
	[0.0018469]	[0.0007486]	[0.0011049]	[0.0020077]
Number of observations:	**153**	**112**	**163**	**100**
Number of groups:	**25**	**18**	**27**	**16**
Arellano – Bond test for	**z = -2.04**	**z = -1.90**	**z = -1.88**	**z = -1.80**
AR(1) in first differences:	**Pr > z =0.0416**	**Pr > z = 0.0571**	**Pr > z =0.0603**	**Pr > z=0.0726**
Arellano – Bond test for	**z = 1.32**	**z = 1.33**	**z = -1.31**	**z = -0.08**
AR(2) in first differences:	**Pr > z =0.1854**	**Pr > z =0.1844**	**Pr > z=0.1907**	**Pr > z=0.9342**
Sargan test:	**$Chi^2(54)$**	**$Chi^2(54)$**	**$Chi^2(54)$**	**$Chi^2(54)$**

	= 21.00 Prob > chi^2 = 1.0000	= 14.02 Prob > chi^2 = 1.0000	= 18.40 Prob > chi^2 = 1.0000	= 8.21 Prob > chi^2 = 1.0000

Notes: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.

Table 1.10: Principal components type financial development indices and the Chinn and Ito index of capital account openness

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.690***	0.908***	0.225***	0.388***
	(140.4)	(94.97)	(235.8)	(59.98)
	[0.00492]	[0.00956]	[0.000954]	[0.00647]
ΔKAOPEN	0.0965***	-0.0304***	0.0545***	-0.0273***
	(18.75)	(-13.22)	(5.969)	(-6.925)
	[0.00515]	[0.00230]	[0.00913]	[0.00395]
ΔTrade openness	0.0038***	0.0016***	0.0123***	0.0103***
	(20.82)	(13.62)	(74.08)	(23.23)
	[0.000180]	[0.000116]	[0.000166]	[0.000442]
ΔLog GDP per capita	0.181***	-0.218***	0.602***	0.674***
	(4.442)	(-10.62)	(29.70)	(15.10)
	[0.0408]	[0.0205]	[0.0203]	[0.0446]
ΔInstitutional Quality	-0.0873***	-0.0613***	-0.140***	-0.0425***
	(-24.19)	(-20.42)	(-19.23)	(-3.385)
	[0.00361]	[0.00300]	[0.00726]	[0.0125]
ΔSecondary School Enrollment	0.0001	-0.0002***	-0.0055***	-0.0004**
	(0.734)	(-3.004)	(-28.48)	(-2.447)
	[0.000185]	[7.04e-05]	[0.000193]	[0.000143]
Number of observations:	**373**	**318**	**420**	**276**
Number of groups:	**54**	**41**	**57**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -1.06 Pr > z = 0.2881**	**z = -2.50 Pr > z = 0.0124**	**z = -1.93 Pr > z = 0.0541**	**z = -2.07 Pr > z = 0.0387**
Arellano – Bond test for AR(2) in first differences:	**z = 0.87 Pr > z = 0.3831**	**z = -2.03 Pr > z = 0.0428**	**z = -1.01 Pr > z = 0.3112**	**z = -0.45 Pr > z = 0.6558**
Sargan test:	**$Chi^2(54)$= 51.66 Prob > chi^2**	**$Chi^2(54)$= 36.78 Prob > chi^2**	**$Chi^2(54)$= 51.03 Prob > chi^2**	**$Chi^2(54)$= 35.27 Prob > chi^2**

	= 0.5651	**= 0.9648**	**= 0.5897**	**= 0.9773**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices for banking sector, bond and stock market and overall financial development are constructed following the principal component methodology that utilizes all components. KAOPEN is the Chinn and Ito index of capital account openness. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.11: Individual financial development measures and the Chinn and Ito index of capital account openness

	Dependent Variables							
	ΔLiquid Liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal bank assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	0.601***	0.609***	0.150***	0.561***	0.982***	0.500***	0.0985***	0.485***
	(52.84)	(277.7)	(173.2)	(100.4)	(243.7)	(199.9)	(137.5)	(3,819)
	[0.0114]	[0.00219]	[0.000865]	[0.00559]	[0.00403]	[0.00250]	[0.000716]	[0.000127]
ΔKAOPEN	1.013***	1.362***	-1.113***	1.053***	0.676***	-8.854***	13.08***	-6.110***
	(6.273)	(13.17)	(-68.14)	(6.970)	(3.418)	(-29.47)	(37.62)	(-27.17)
	[0.162]	[0.103]	[0.0163]	[0.151]	[0.198]	[0.300]	[0.348]	[0.225]
ΔTrade openness	0.0656***	0.105***	-0.0283***	0.187***	0.0534***	0.553***	0.499***	1.096***
	(10.17)	(20.29)	(-84.20)	(39.09)	(9.375)	(35.09)	(57.29)	(1,256)
	[0.00645]	[0.00517]	[0.000336]	[0.00479]	[0.00569]	[0.0158]	[0.00870]	[0.000873]
ΔLog GDP per capita	6.465***	7.489***	17.83***	3.550*	-4.777***	64.59***	-50.81***	114.5***
	(9.703)	(8.143)	(208.3)	(1.942)	(-2.748)	(40.68)	(-61.01)	(512.4)
	[0.666]	[0.920]	[0.0856]	[1.828]	[1.738]	[1.588]	[0.833]	[0.223]
ΔInstitutional Quality	-2.448***	-2.168***	0.0457**	-0.414***	-4.953***	-10.84***	-14.48***	-6.836***
	(-16.67)	(-22.12)	(2.406)	(-3.957)	(-30.60)	(-31.90)	(-92.57)	(-42.26)
	[0.147]	[0.0980]	[0.0190]	[0.105]	[0.162]	[0.340]	[0.156]	[0.162]
ΔSecondary School Enrollment	-0.0517***	-0.0759***	0.0801***	0.0004	-0.0223***	-0.0150**	-0.442***	-0.458***
	(-13.58)	(-20.59)	(35.14)	(0.100)	(-6.438)	(-2.080)	(-99.89)	(-129.5)
	[0.00381]	[0.00369]	[0.00228]	[0.00426]	[0.00346]	[0.00722]	[0.00442]	[0.00354]
Number of observations:	**399**	**408**	**386**	**376**	**411**	**420**	**420**	**420**
Number of groups:	**56**	**56**	**55**	**54**	**57**	**57**	**57**	**57**
Arellano – Bond test for AR(1) in first differences:	**z = -0.78 Pr > z =0.4337**	**z = 0.31 Pr > z = 0.7551**	**z = -0.97 Pr > z = 0.3325**	**z = 0.93 Pr > z = 0.3531**	**z = -2.12 Pr > z = 0.0339**	**z = 0.18 Pr > z = 0.8564**	**z = -1.54 Pr > z = 0.1224**	**z = -2.02 Pr > z = 0.0439**
Arellano – Bond test for AR(2) in first differences:	**z = -1.85 Pr > z =0.0641**	**z = -1.79 Pr > z = 0.0732**	**z = 1.07 Pr > z = 0.2883**	**z = -1.66 Pr > z = 0.0961**	**z = 1.23 Pr > z = 0.2174**	**z = -1.96 Pr > z = 0.0495**	**z = -1.07 Pr > z = 0.2865**	**z = 0.18 Pr > z = 0.8570**
Sargan test:	**$Chi^2(54)$=53.57 Prob > chi^2**	**$Chi^2(54)$= 52.70 Prob > chi^2**	**$Chi^2(54)$= 48.90 Prob > chi^2**	**$Chi^2(54)$= 49.00 Prob > chi^2**	**$Chi^2(54)$= 53.78 Prob > chi^2**	**$Chi^2(54)$= 52.34 Prob > chi^2**	**$Chi^2(54)$= 52.55 Prob > chi^2**	**$Chi^2(54)$= 53.93 Prob > chi^2**

	= 0.4909	= 0.5247	= 0.6708	= 0.6673	= 0.4828	= 0.5386	= 0.5306	= 0.4770

Notes: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices for banking sector, bond and stock market and overall financial development are constructed following the principal component methodology that utilizes all components. KAOPEN is the Chinn and Ito index of capital account openness, the dependent variables are: Liquid liabilities (% of GDP), Private credit by deposit money banks and other institutions (% of GDP), Deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.

Table 1.12: Principal component type financial openness index and individual financial development measures

	Dependent Variables							
	ΔLiquid liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal bank assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	0.8998***	0.6198***	0.7784***	0.572***	0.9748***	0.522***	0.0998***	0.5103***
	(454.64)	(143.51)	(481.82)	(149.82)	(102.77)	(173.98)	(361.07)	(1809.72)
	[0.0019791]	[0.004319]	[0.0016155]	[0.0038166]	[0.0094847]	[0.0029979]	[0.0002764]	[0.000282]
ΔFinancial openness	0.7643***	3.7167***	-1.158***	9.509***	0.0235	2.934***	4.9186***	6.661***
	(55.85)	(45.67)	(-76.08)	(53.13)	(0.21)	(27.67)	(32.15)	(52.82)
	[0.0136861]	[0.0813903]	[0.0152147]	[0.1789926]	[0.1123886]	[0.1060275]	[0.1530111]	[0.1261231]
ΔTrade openness	0.0730***	0.1259***	-0.0148***	0.1391***	0.1283**	0.7294***	0.3289***	1.0343***
	(9.28)	(14.75)	(-24.75)	(17.76)	(21.17)	(71.12)	(19.50)	(350.27)
	[0.0078662]	[0.0085404]	[0.0005986]	[0.0077456]	[0.0060617]	[0.0102561]	[0.0168636]	[0.0029528]
ΔLog GDP per capita$_t$	3.1754***	9.476***	5.831***	0.212	-1.81506	36.911***	-53.90***	95.845***
	(2.86)	(6.58)	(65.41)	(0.14)	(-1.26)	(30.61)	(-55.64)	(129.62)
	[1.111859]	[1.440603]	[0.0891392]	[1.530057]	[1.440914]	[1.205813]	[0.9687153]	[0.7394168]
ΔInstitutional Quality	-4.687***	-2.935***	1.0541***	2.631***	-7.934***	-15.222***	-12.961***	-3.973***
	(-16.31)	(-24.27)	(49.91)	(16.04)	(-25.33)	(-59.65)	(-46.04)	(-12.57)
	[0.2873217]	[0.1208917]	[0.021122]	[0.16396]	[0.313209]	[0.2551843]	[0.28153]	[0.3161314]
ΔSecondary School Enrollment	-0.0948**	-0.0628***	0.00366***	0.0695***	-0.092***	-0.01422*	-0.427***	-0.392***
	(-8.17)	(-15.35)	(17.00)	(36.40)	(-21.28)	(-1.88)	(-27.43)	(-119.80)
	[0.0115953]	[0.0040934]	[0.0002152]	[0.0019105]	[0.0042989]	[0.0075512]	[0.0155645]	[0.0032682]
Number of observations:	**357**	**365**	**344**	**335**	**368**	**376**	**376**	**376**
Number of groups:	**53**	**53**	**51**	**50**	**54**	**54**	**54**	**54**
Arellano – Bond test for AR(1) in first differences:	**z = -0.50 Pr > z=0.6200**	**z = -0.16 Pr > z=0.8734**	**z = -2.88 Pr >z=0.0039**	**z = 0.52 Pr > z=0.5997**	**z = -2.06 Pr >z =0.0390**	**z = 0.54 Pr >z=0.5878**	**z = -1.53 Pr>z=0.1256**	**z = -1.93 Pr >z=0.0539**
Arellano – Bond test for AR(2) in first differences:	**z = -1.63 Pr>z=0.1024**	**z = -1.55 Pr > z=0.1208**	**z = -1.63 Pr >z=0.1027**	**z = -1.29 Pr > z=0.1982**	**z = 1.67 Pr >z =0.0942**	**z = -2.20 Pr >z=0.0275**	**z = -1.06 Pr>z=0.2914**	**z = 0.25 Pr >z=0.8056**
Sargan test:	**Chi^2(54)**	**Chi^2(54)**	**Chi^2(54)**	**Chi^2(54)**	**Chi^2(54)**	**Chi^2(54)**	**Chi^2(54)**	**Chi^2(54)**

	= 50.84 Prob >chi^2 = 0.5970	= 46.85 Prob >chi^2 = 0.7441	= 44.53 Prob >chi^2 = 0.8175	= 47.30 Prob >chi^2 = 0.7286	= 51.00 Prob > chi^2 = 0.5908	= 48.15 Prob > chi^2 = 0.6984	= 45.83 Prob > chi^2 = 0.7776	= 50.40 Prob > chi^2 = 0.6139

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The variables are: Liquid liabilities (% of GDP), Private credit by deposit money banks and other institutions (% of GDP), The ratio of deposit money bank assets to the sum of deposit money bank assets to central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages),and Stock market total value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

1.10 Additional Appendices

1.10.1 Data Appendix

Financial openness indicators:

Foreign direct investment: It is the sum of net inflows and outflows of foreign direct investment recorded as a percentage of GDP. This indicator brings together equity capital, reinvestment earning and other short and long-term capital. It is one of the most frequently used indicators in capital flows, financial openness/globalization literature. *Source: World Bank's World Development Indicators Database (2007)*

Portfolio investment flows (% of GDP): These flows sum portfolio debt flows (public and publicly guaranteed and private nonguaranteed bond issues purchased by foreign investors) and non-debt-creating portfolio equity flows which are equal to the sum of country funds, depository receipts, and direct purchases of shares by foreign investors (World Bank, 2007). They exclude liabilities constituting foreign authorities' reserves. Portfolio investment flows are used as an indicator for private capital flows. They are given as a percentage of GDP. Portfolio investment flows together with foreign direct investment represent the incoming stream of investment and capital opportunities that countries attract as a result of opening up their financial markets. *Source: World Bank's World Development Indicators Database (2007)*

International debt issues (% of GDP): International debt flows measures the net flow of international bond issues relative to a country's economic activity (Beck, Demirguc-Kunt, and Levine, 2009). This variable increases in the income level. Examining country wide data we can see that high-income countries have the highest issues of international debt relative to GDP. This indicator measures "the degree to which a country's financial system is interlinked with international financial markets." (Beck, Demirguc-Kunt, and Levine, 2009, 15). It helps in examining net flows of bond issues and in bringing a view from the bond market. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Financial development indicators

a) Banking sector development indicators:

Liquid liabilities (% of GDP): It is the sum of currency, demand and interest bearing liabilities of banks and other financial intermediaries represented as a percentage of the GDP. Liquid liabilities is the broadest indicator of financial intermediation due its inclusion of three financial sectors (Beck, Demirguc-Kunt, and Levine, 2009). *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Private credit by deposit money banks and other institutions (% of GDP): It is an indicator for the overall development in private banking markets (Chinn and Ito, 2006). This variable refers to financial resources provided to the private sector by deposit money banks and other financial

institutions through loans, purchases of nonequity securities, and trade credits. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages): It is equal to the deposit money bank assets divided by the sum of deposit money bank assets and central bank assets. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Total bank assets (% of GDP): It is the sum of central bank assets to GDP and deposit money bank assets to GDP. It is used to represent the overall size of the banking sector. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Domestic credit provided by the banking sector (% of GDP): It includes credit extended to the private sector and general government, to the nonfinancial public sector in the form of investments in short- and long-term government securities, to banking and nonbank institutions and loans to state enterprises but excludes credit to the central government. *Source: World Bank's World Development Indicators Database (2007)*

b) Stock market development indicators:

Stock market capitalization (% of GDP): It is equal to the value of listed shares divided by GDP. It is an indicator of the size of the stock market. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Stock market turnover ratio (in percentages): It is used as the efficiency indicator of stock markets (Demirguc-Kunt and Levine, 2001). Stock market turnover ratio measures "the activity or liquidity of a stock market relative to its size." (Demirguc-Kunt and Levine, 2001, 32). Note that small and active stock markets will have a larger turnover ratio based on the above definition whereas large and less liquid stock markets will have a lower turnover ratio. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Stock market total value traded (% of GDP): It is equal to the total shares traded on the stock market exchange divided by GDP. This indicator measures the activity or liquidity of the stock markets (Demirguc-Kunt and Levine, 2001). *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

c) Bond market development indicators:

Private bond market capitalization (% of GDP): It is equal to the total amount of outstanding domestic debt securities issued by financial institutions and corporations as a share of GDP. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Public bond market capitalization (% of GDP): It is equal to the total amount of public domestic securities issued by governments as a share of GDP. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Control Variables

Logarithm of GDP per capita: It is measured in constant 2000 US dollars and we take the logarithm. *Source: World Bank's World Development Indicators Database (2007)*

Trade openness (% of GDP): It is the sum of imports and exports of goods and services. *Source: World Bank's World Development Indicators Database (2007)*

Secondary school gross enrolment rate (% of population): It is used as an indicator that controls for differences in educational attainment across countries. We take secondary school gross enrollment rate as a possible determinant for why we examine differences across countries in terms of grasping the benefits of financial liberalization. *Source: World Bank's Edstats Database*

Legal and institutional variable: They are used to measure economic institutions and the overall quality of legal systems. We employ four different measures to control for institutional, legal, political and economic factors that may affect the overall level of financial development. The four variables used reflect the "statistical compilation of responses on the quality of governance given by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries, as reported by a number of survey institutes, think tanks, non-governmental organizations, and international organizations." [30] These indicators are *government effectiveness*, *regulatory quality, rule of law,* and *control corruption* and are measured through a range from-2.5 to 2.5 where higher values correspond to better governance outcomes. *Source: World Bank's Worldwide Governance Indicators*.

[30] Please refer to the Worldwide Governance Indicators (WGI) dataset. 1996 – 2009. World Bank. http://info.worldbank.org/governance/wgi/index.asp (Excel sheet)

1.10.2 Supplementary Appendix

Abbreviations

BDE: *Equally weighted banking sector development index*
BDC: *Coefficient of variation type banking sector development index*
BDPC: *First score principal components type banking sector development index*
BDPCA: *Principal components type banking sector development index*
BMDE: *Equally weighted bond market development index*
BMDC: *Coefficient of variation type bond market sector development index*
BMDPC: *First score principal components type bond market development index*
BMDPCA: *Principal components type stock market development index*
SMDE: *Equally weighted stock market development index*
SMDC: *Coefficient of variation type stock market development index*
SMDPC: *First score principal components type stock market development index*
SMDPCA: *Principal components type stock market development index*

Table 1.1.1 (a): Summary of pairwise correlations for the financial openness variables and indices

Variables	FDI	Int. debt issues	Portfolio investment	Equally weighted FO	Coefficient of variation FO	First component FO	Principal components FO
FDI	1.0000						
International debt issues	0.5409*	1.0000					
Portfolio investment	0.9224*	0.4588*	1.0000				
Equally weighted financial openness	0.9787*	0.6919*	0.9225*	1.0000			
Coefficient of variation financial openness	0.9815*	0.5426*	0.9783*	0.9768*	1.0000		
First component financial openness	0.9566*	0.7260*	0.9313*	0.9949*	0.9716*	1.0000	
Principal components financial openness	0.9165*	0.8134*	0.8810*	0.9791*	0.9300*	0.9906*	1.0000

Notes: *FDI= Foreign direct investment (% of GDP), international debt issues (% of GDP), Portfolio investment = portfolio investment flows (% of GDP). The indices for financial openness are the equally weighted financial openness index, the coefficient of variation type financial openness index, first score principal components type financial openness index, and the principal components type financial openness index. * represents the significances at the %5 percent level.*

Table 1.1.1 (b): Summary of pairwise correlations for the banking sector development variables and indices

Variables	Liquid Liabilities	Private credit	Deposit bank assets	Total bank assets	Domestic Credit	BDE	BDC	BDPC	BDPCA
Liquid Liability	1.0000								
Private credit	0.6432*	1.0000							
Deposit bank assets	0.3487*	0.4864*	1.0000						
Total bank assets	0.8126*	0.8387*	0.3265*	1.0000					
Domestic credit	0.6475*	0.8826*	0.3343*	0.8730*	1.0000				
BDE	0.8612*	0.9314*	0.4676*	0.9405*	0.9522*	1.0000			
BDC	0.8667*	0.9290*	0.4433*	0.9392*	0.9548*	0.9995*	1.0000		
BDPC	0.8637*	0.9298*	0.5347*	0.9331*	0.9335*	0.9966*	0.9941*	1.0000	
BDPCA	0.8379*	0.9236*	0.6396*	0.9000*	0.9038*	0.9784*	0.9724*	0.9916*	1.0000

Notes: *Liquid liabilities (% of GDP), Private credit by deposit money banks and other institutions (% of GDP), The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), BDE = Equally weighted banking sector development index, BDC = Coefficient of variation type banking sector development index, BDPC = First score principal components type banking sector development index, BDPCA = Principal components type banking sector development index. * represents the significances at the %5 percent level.*

Table 1.1.1 (c): Summary of pairwise correlations for the bond market development variables and indices

Variables	Private bond market capitalization	Public bond market capitalizaton	BMDE	BMDC	BMDPC	BMDPCA
Private bond market capitalization	1.0000					
Public bond market capitalization	0.3451*	1.0000				
BMDE	0.8456*	0.7928*	1.0000			
BMDC	0.9232*	0.6794*	0.9858*	1.0000		
BMDPC	0.8201*	0.8201*	0.9989*	0.9770*	1.0000	
BMDPCA	0.9606*	0.5924*	0.9607*	0.9936*	0.9469*	1.0000

Notes: *Private bond market capitalization (% of GDP), Public bond market capitalization (% of GDP), BMDE = Equally weighted bond market development index, BMDC = Coefficient of variation type bond market development index, BMDPC = First score principal components type bond market development index, BMDPCA = Principal components type bond market development index. * represents the significances at the %5 percent level.*

Table 1.1.1 (d): Summary of pairwise correlations for the stock market development variables and indices

Variables	Stock market caitalization	Stock market turnover	Stock market total value traded	SMDE	SMDC	SMDPC	SMDPCA
Stock market capitalization	1.0000						
Stock market turnover	0.1084*	1.0000					
Stock market total value traded	0.6862*	0.6003*	1.0000				
SMDE	0.7443*	0.7120*	0.9498*	1.0000			
SMDC	0.7156*	0.7279*	0.9593*	0.9987*	1.0000		
SMDPC	0.7591*	0.6822*	0.9620*	0.9987*	0.9978*	1.0000	
SMDPCA	0.5480*	0.8635*	0.9104*	0.9656*	0.9735*	0.9561*	1.0000

Notes: *Stock market capitalization: Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market total value traded (% of GDP), SMDE = Equally weighted stock market development index, ESMD = Equally weighted stock market development index, SMDC = Coefficient of variation type stock market development index, SMDPC = First score principal components type stock market development index, SMDPCA = Principal components type stock market development index. * represents the significances at the %5 percent level.*

Table 1.1.2: Principal component type financial development and financial openness indices excluding some controls variables

	ΔBanking sector development		ΔBond market development		ΔStock market development		ΔFinancial development	
Models	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
ΔDependent variable (Lagged)	.8487*** (86.08) [0.00986]	.8642*** (102.40) [0.00844]	.803*** (87.11) [0.00922]	.8034*** (91.92) [0.00874]	.2349*** (350.41) [0.00067]	.1794*** (135.76) [0.00132]	.2969*** (68.48) [0.004336]	.3285*** (47.14) [0.00697]
ΔFinancial openness	.1083*** (14.99) [0.00722]	.0953*** (11.31) [0.00842]	.1077*** (22.91) [0.00470]	.0957*** (23.92) [0.00400]	.0912*** (5.82) [0.01567]	.1065*** (6.45) [0.01651]	.4811*** (31.63) [0.015211]	.4656*** (31.87) [0.014606]
ΔTrade openness	.0019*** (5.16) [0.00036]	-.0002 (-1.16) [0.00018]	.0004** (2.19) [0.00019]	.0004*** (5.95) [0.00007]	.0105*** (69.03) [0.00015]	.0029*** (26.04) [0.00011]	.0061*** (15.04) [0.000405]	.0019*** (5.68) [0.00034]
ΔLog GDP per capita	.1084*** (2.52) [0.04299]	.2907*** (10.11) [0.02877]	-.1535** (-6.69) [0.02294]	-.0991** (-6.45) [0.01536]	.4274** (24.71) [0.01729]	1.379*** (74.86) [0.01842]	0.453*** (18.70) [0.024189]	.9191*** (22.70) [0.040488]
ΔInstitutional Quality	-	-.0257*** (-2.37) [0.01084]	-	-.063*** (-20.98) [0.00299]	-	-.1461*** (-11.48) [0.01273]	-	.0622*** (11.37) [0.00547]
ΔSecondary School Enrollment	0.0008*** (4.20) [0.000187]	-	0.0001** (0.98) [0.00014]	-	-.005*** (-20.98) [0.00021]	-	.0022*** (5.82) [0.00038]	-
Number of observations:	333	424	301	386	376	499	262	328
Number of groups:	50	51	41	42	54	57	38	39
Arellano – Bond test for AR(1) in first differences:	z = -2.48 Pr > z=0.0132	z = -3.05 Pr > z=0.0023	z = -2.40 Pr > z=0.0162	z = -2.66 Pr > z=0.0079	z = -1.91 Pr > z=0.0559	z = -2.55 Pr > z =0.0108	z = -1.92 Pr > z=0.0551	z = -2.43 Pr > z=0.0153

Arellano – Bond test for AR(2) in first differences:	z = -1.47 Pr > z =0.1415	z = -1.96 Pr > z =0.0503	z = -1.67 Pr > z =0.0940	z = -1.79 Pr > z =0.0743	z = -0.94 Pr > z =0.3463	z = -0.87 Pr > z =0.3848	z = -1.08 Pr > z =0.2799	z = -0.54 Pr > z =0.5911
Sargan test:	$Chi^2(54)$ = 44.66 Prob >chi^2 = 0.8136	$Chi^2(54)$ = 43.54 Prob >chi^2 = 0.8449	$Chi^2(54)$ = 39.65 Prob >chi^2 = 0.9279	$Chi^2(54)$ = 37.97 Prob>chi^2 = 0.9518	$Chi^2(54)$ = 50.08 Prob>chi^2= 0.6263	$Chi^2(54)$= 51.07 Prob>chi^2= 0.5881	$Chi^2(54)$= 33.25 Prob>chi^2 = 0.9882	$Chi^2(54)$ = 34.88 Prob >chi^2 = 0.9799

Regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. Model (a) excludes the institutional quality index whereas Model (b) excludes the secondary school enrollment rate. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.

Table 1.1.3: Principal component type financial openness and financial development indices, predetermined variables

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.8673***	0.7507***	0.2811***	0.3585***
	(105.88)	(30.04)	(56.81)	(32.57)
	[0.0081914]	[0.024991]	[0.0049475]	[0.0110051]
ΔFinancial openness	0.1249***	0.1012***	0.0959***	0.5899***
	(4.70)	(10.62)	(12.87)	(7.44)
	[0.0265703]	[0.0095269]	[0.0074586]	[0.0793222]
ΔTrade openness	-0.00032	-0.0016***	0.0121***	0.0036**
	(-0.60)	(-8.94)	(55.33)	(2.58)
	[0.0005293]	[0.0001787]	[0.0002193]	[0.0013977]
ΔLog GDP per capita	0.328***	0.1089***	0.4732***	0.4470***
	(8.09)	(5.77)	(10.87)	(5.84)
	[0.0405353]	[0.0188902]	[0.0435262]	[0.0765868]
ΔInstitutional Quality	0.0219	-0.0022	-0.2815***	0.1116**
	(0.70)	(-0.42)	(-15.22)	(2.57)
	[0.031476]	[0.0051538]	[0.0184928]	[0.0435062]
ΔSecondary School Enrollment	0.0008	-0.0015***	-0.0090***	0.0002
	(1.49)	(-5.64)	(-12.24)	(0.38)
	[0.0005042]	[0.0002618]	[0.0007356]	[0.0005737]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for	**z = -2.65**	**z = -2.28**	**z = -1.91**	**z = -2.06**
AR(1) in first differences:	**Pr > z =0.0081**	**Pr > z =0.0224**	**Pr > z =0.0560**	**Pr >z=0.0392**
Arellano – Bond test for	**z = -1.51**	**z = -1.56**	**z = -0.96**	**z = -1.11**

AR(2) in first differences:	**Pr > z =0.1312**	**Pr > z=0.1179**	**Pr > z=0.3359**	**Pr >z=0.2991**
Sargan test:	**$Chi^2(99)$ = 47.44 Prob > chi^2 = 1.0000**	**$Chi^2(99)$ = 34.21 Prob > chi^2 = 1.0000**	**$Chi^2(99)$ = 52.59 Prob > chi^2 = 1.0000**	**$Chi^2(99)$ = 35.05 Prob > chi^2 = 1.0000**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. All variables with the exception of the lag of the dependent variable are treated as being predetermined. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.4: Principal component type financial openness and financial development indices, endogenous variables

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.8218***	0.7907***	0.2457***	0.2901***
	(174.04)	(98.46)	(288.82)	(107.68)
	[0.0047217]	[0.0080307]	[0.0008506]	[0.0026944]
ΔFinancial openness	0.1664***	0.1428***	0.4838***	0.587***
	(12.10)	(10.30)	(27.84)	(14.98)
	[0.0137494]	[0.01386]	[0.017376]	[0.039223]
ΔTrade openness	0.0047***	-0.0009*	0.0108***	0.012***
	(8.60)	(-2.00)	(50.59)	(12.95)
	[0.0005462]	[0.0004647]	[0.0002133]	[0.0009279]
ΔLog GDP per capita	0.0559	-0.0934***	0.2299***	0.1718*
	(1.48)	(-2.94)	(9.21)	(1.94)
	[0.0376452]	[0.0317837]	[0.0249748]	[0.0885554]
ΔInstitutional Quality	0.0206	-0.0334***	-0.0973***	0.1024***
	(1.44)	(-7.99)	(-14.49)	(12.82)
	[0.0143207]	[0.0041755]	[0.0067176]	[0.0079898]
ΔSecondary School Enrollment	0.002***	0.0003**	-0.0019***	0.0035***
	(7.29)	(2.54)	(-5.60)	(8.77)
	[0.0002739]	[0.0001114]	[0.0003296]	[0.0003994]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for	**z = -2.31**	**z = -2.41**	**z = -1.97**	**z = -1.94**
AR(1) in first differences:	**Pr > z =0.0208**	**Pr > z =0.0158**	**Pr > z =0.0494**	**Pr >z=0.0519**
Arellano – Bond test for	**z = -1.48**	**z = -1.63**	**z = -1.06**	**z = -1.18**

AR(2) in first differences:	**Pr > z =0.1397**	**Pr > z=0.1035**	**Pr > z=0.2907**	**Pr >z=0.2386**
Sargan test:	**$Chi^2(52)$ = 46.77 Prob > chi^2 = 0.6792**	**$Chi^2(52)$ = 35.35 Prob > chi^2 = 0.9626**	**$Chi^2(52)$ = 50.03 Prob > chi^2 = 0.5519**	**$Chi^2(52)$ = 34.74 Prob > chi^2 = 0.9685**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. All variables with the exception of the lag of the dependent variable are treated as being endogenous. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.5: Principal components type financial openness and financial development indices with time dummies and a trend, complete results

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.848***	0.768***	0.174***	0.320***
	(48.95)	(23.53)	(27.61)	(13.36)
	[0.0173]	[0.0326]	[0.00631]	[0.0239]
ΔFinancial openness	-0.0303	0.0009	0.0832**	0.378***
	(-1.381)	(0.0888)	(2.523)	(9.680)
	[0.0220]	[0.0101]	[0.0330]	[0.0390]
ΔTrade openness	0.0005	0.0007*	0.0049***	0.0002
	(0.828)	(1.747)	(7.381)	(0.120)
	[0.000596]	[0.000380]	[0.000674]	[0.00170]
ΔLog GDP per capita	-0.826***	-0.657***	-0.623*	-1.086***
	(-5.257)	(-8.205)	(-1.675)	(-2.686)
	[0.157]	[0.0801]	[0.372]	[0.404]
ΔInstitutional Quality	0.0006	-0.0219**	-0.0964***	0.105**
	(0.0317)	(-2.285)	(-2.599)	(2.339)
	[0.0179]	[0.00958]	[0.0371]	[0.0450]
ΔSecondary School Enrollment	0.0016***	0.0012***	-0.0041***	0.0024*
	(3.107)	(3.125)	(-3.275)	(1.686)
	[0.000509]	[0.000371]	[0.00126]	[0.00142]
Δt	0.0359***	0.0280***	0.0803***	0.0686***
	(8.054)	(11.89)	(6.004)	(4.977)
	[0.00446]	[0.00235]	[0.0134]	[0.0138]
Δyear 1998 dummy	0.0196*	0.0786***	-0.0752***	0.0217
	(1.828)	(14.55)	(-2.936)	(1.422)
	[0.0107]	[0.00540]	[0.0256]	[0.0153]
Δyear 1999 dummy	0.00137	0.0501***	0.0315	0.0781***

	(0.133)	(7.451)	(1.408)	(3.551)
	[0.0103]	[0.00673]	[0.0223]	[0.0220]
Δyear 2000 dummy	-0.0442***	0.0277***	0.276***	0.203***
	(-3.173)	(3.107)	(9.444)	(4.466)
	[0.0139]	[0.00893]	[0.0292]	[0.0454]
Δyear 2001 dummy	-0.0640***	-0.0009	-0.0574***	-0.043
	(-4.462)	(-0.129)	(-2.769)	(-1.423)
	[0.0143]	[0.00676]	[0.0207]	[0.0302]
Δyear 2002 dummy	-0.0802***	0.0100	-0.138***	-0.116***
	(-5.728)	(1.390)	(-7.136)	(-4.765)
	[0.0140]	[0.00722]	[0.0193]	[0.0243]
Δyear 2003 dummy	-0.0902***	0.0038	-0.321***	-0.217***
	(-7.458)	(0.512)	(-13.98)	(-8.703)
	[0.0121]	[0.00744]	[0.0230]	[0.0249]
Δyear 2004 dummy	-0.100***	0.00775	-0.321***	-0.178***
	(-9.573)	(1.069)	(-21.34)	(-11.19)
	[0.0105]	[0.00725]	[0.0150]	[0.0159]
Δyear 2005 dummy	-0.0533***	-0.0295***	-0.270***	-0.145***
	(-6.774)	(-3.930)	(-20.31)	(-8.534)
	[0.00786]	[0.00752]	[0.0133]	[0.0169]
Δyear 2006 dummy	-0.0435***	-0.0298***	-0.248***	-0.106***
	(-6.820)	(-4.667)	(-22.98)	(-8.387)
	[0.00638]	[0.00639]	[0.0108]	[0.0127]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.27 Pr > z = 0.0231**	**z = -2.52 Pr > z = 0.0116**	**z = -1.85 Pr > z = 0.0642**	**z = -2.10 Pr > z = 0.0357**
Arellano – Bond test for AR(2) in first differences:	**z = -1.51 Pr > z = 0.1314**	**z = -1.18 Pr > z = 0.2383**	**z = -1.20 Pr > z = 0.2318**	**z = -1.10 Pr > z = 0.2733**
Sargan test:	**$Chi^2(54)$= 31.23 Prob > chi^2**	**$Chi^2(54)$= 25.78 Prob > chi^2**	**$Chi^2(54)$= 45.95 Prob > chi^2**	**$Chi^2(54)$= 22.67 Prob > chi^2**

	= 0.9945	**= 0.9996**	**= 0.7740**	**= 0.9999**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The model above includes a linear time trend and time dummies. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.6: Principal components type financial openness and financial development indices with time dummies

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.840***	0.771***	0.176***	0.322***
	(37.94)	(21.42)	(31.83)	(8.378)
	[0.0221]	[0.0360]	[0.00554]	[0.0385]
ΔFinancial openness	-0.0264	0.0006	0.0669**	0.363***
	(-1.099)	(0.0611)	(2.087)	(8.688)
	[0.0241]	[0.00934]	[0.0321]	[0.0417]
ΔTrade openness	0.0006	0.0006	0.0053***	0.000322
	(1.018)	(1.646)	(8.231)	(0.183)
	[0.000582]	[0.000387]	[0.000640]	[0.00176]
ΔLog GDP per capita	-0.747***	-0.649***	-0.708*	-0.774
	(-4.632)	(-8.377)	(-1.907)	(-1.495)
	[0.161]	[0.0775]	[0.371]	[0.518]
ΔInstitutional Quality	-0.0098	-0.0211**	-0.0782**	0.0801**
	(-0.352)	(-2.161)	(-2.443)	(2.113)
	[0.0280]	[0.00975]	[0.0320]	[0.0379]
ΔSecondary School Enrollment	0.0014**	0.0012***	-0.0044***	0.00296*
	(2.519)	(3.122)	(-3.584)	(1.663)
	[0.000544]	[0.000374]	[0.00123]	[0.00178]
Δyear 1998 dummy	0.0519***	0.105***	0.0078	0.104***
	(5.054)	(14.29)	(0.396)	(3.703)
	[0.0103]	[0.00733]	[0.0198]	[0.0281]
Δyear 1999 dummy	0.0668***	0.105***	0.207***	0.228***
	(7.156)	(12.26)	(6.847)	(5.167)
	[0.00933]	[0.00856]	[0.0303]	[0.0441]
Δyear 2000 dummy	0.0578***	0.111***	0.543***	0.417***

	(3.776)	(10.79)	(9.463)	(5.068)
	[0.0153]	[0.0103]	[0.0574]	[0.0822]
Δyear 2001 dummy	0.0670***	0.109***	0.282***	0.240***
	(3.556)	(8.853)	(4.761)	(3.036)
	[0.0188]	[0.0123]	[0.0592]	[0.0792]
Δyear 2002 dummy	0.0808***	0.148***	0.289***	0.239***
	(3.520)	(11.52)	(4.528)	(2.689)
	[0.0230]	[0.0128]	[0.0638]	[0.0890]
Δyear 2003 dummy	0.111***	0.170***	0.177***	0.196*
	(4.674)	(13.16)	(2.650)	(1.969)
	[0.0239]	[0.0129]	[0.0667]	[0.0998]
Δyear 2004 dummy	0.132***	0.201***	0.261***	0.302**
	(4.536)	(14.29)	(3.090)	(2.416)
	[0.0290]	[0.0141]	[0.0843]	[0.125]
Δyear 2005 dummy	0.210***	0.192***	0.395***	0.399***
	(6.318)	(10.70)	(4.025)	(2.903)
	[0.0332]	[0.0179]	[0.0982]	[0.137]
Δyear 2006 dummy	0.257***	0.219***	0.503***	0.494***
	(6.721)	(9.968)	(4.278)	(3.116)
	[0.0383]	[0.0220]	[0.118]	[0.159]
Δyear 2007 dummy	0.335***	0.277***	0.836***	0.645***
	(7.848)	(12.01)	(6.341)	(3.900)
	[0.0427]	[0.0231]	[0.132]	[0.165]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.23 Pr > z = 0.0260**	**z = -2.55 Pr > z = 0.0107**	**z = -1.86 Pr > z = 0.0626**	**z = -1.99 Pr > z = 0.0460**
Arellano – Bond test for AR(2) in first differences:	**z = -1.51 Pr > z = 0.1319**	**z = -1.19 Pr > z = 0.2332**	**z = -1.19 Pr > z = 0.2329**	**z = -1.13 Pr > z = 0.2592**
Sargan test:	**$Chi^2(54)$= 37.16 Prob > chi^2 = 0.9610**	**$Chi^2(54)$= 26.05 Prob > chi^2 = 0.9995**	**$Chi^2(54)$= 48.30 Prob > chi^2 = 0.6930**	**$Chi^2(54)$= 21.53 Prob > chi^2 = 1.0000**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The model above includes time dummies. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.7: Principal components type financial openness and financial development indices with developing country interaction term

	ΔBanking sector development	ΔBond market development	ΔStock market development	ΔFinancial development
ΔDependent variable (Lagged)	0.851***	0.803***	0.228***	0.288***
	(73.06)	(61.80)	(289.0)	(19.18)
	[0.0116]	[0.0130]	[0.000790]	[0.0150]
ΔFinancial openness	0.104***	0.0960***	0.0871***	0.515***
	(11.99)	(13.04)	(4.432)	(25.68)
	[0.00867]	[0.00736]	[0.0197]	[0.0201]
ΔTrade openness	0.0016***	0.0004***	0.0103***	0.0064***
	(4.052)	(2.860)	(52.30)	(10.10)
	[0.000402]	[0.000136]	[0.000196]	[0.000638]
ΔLog GDP per capita	0.107**	-0.138***	0.538***	0.376***
	(2.372)	(-5.980)	(12.08)	(6.990)
	[0.0450]	[0.0230]	[0.0445]	[0.0538]
ΔInstitutional Quality	-0.0116	-0.0539***	-0.115***	0.0315***
	(-1.163)	(-17.10)	(-10.96)	(2.672)
	[0.00996]	[0.00315]	[0.0105]	[0.0118]
ΔSecondary School Enrollment	0.00101***	8.56e-05	-0.0043***	0.0031***
	(5.867)	(0.757)	(-15.39)	(6.095)
	[0.000173]	[0.000113]	[0.000278]	[0.000500]
ΔInteraction term	-0.0331**	-0.0160	-0.0576***	-0.304***
	(-2.226)	(-1.322)	(-3.165)	(-8.666)
	[0.0149]	[0.0121]	[0.0182]	[0.0351]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for	**z = -2.53**	**z = -2.44**	**z = -1.90**	**z = -1.97**

AR(1) in first differences:	**Pr > z = 0.011**	**Pr > z = 0.0146**	**Pr > z = 0.0570**	**Pr > z = 0.0492**
Arellano – Bond test for	**z = -1.47**	**z = -1.64**	**z = -0.96**	**z = -1.07**
AR(2) in first differences:	**Pr > z = 0.1405**	**Pr > z = 0.1002**	**Pr > z = 0.3371**	**Pr > z = 0.2853**
Sargan test:	**$Chi^2(54)$= 45.18**	**$Chi^2(54)$= 33.68**	**$Chi^2(54)$= 43.97**	**$Chi^2(54)$= 32.81**
	Prob > chi^2 = 0.7982	**Prob > chi^2 = 0.9864**	**Prob > chi^2 = 0.8332**	**Prob > chi^2 = 0.9899**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The model above includes time dummies. The interaction term is equal to the product of financial openness and developing country dummy that takes on a value of one for developing countries and a value of zero for advanced countries. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.8: Principal components type financial openness and financial development indices with developing country and institutional quality interaction terms

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.847***	0.795***	0.225***	0.288***
	(92.06)	(69.41)	(242.9)	(50.99)
	[0.00920]	[0.0114]	[0.000928]	[0.00564]
ΔFinancial openness	0.330***	0.171***	0.237***	0.584***
	(18.00)	(18.29)	(12.47)	(11.90)
	[0.0183]	[0.00936]	[0.0190]	[0.0490]
ΔTrade openness	0.001***	0.0001	0.0095***	0.0067***
	(3.126)	(0.492)	(47.84)	(6.391)
	[0.000319]	[0.000243]	[0.000198]	[0.00105]
ΔLog GDP per capita	0.141***	-0.130***	0.536***	0.365***
	(3.457)	(-5.795)	(14.29)	(4.163)
	[0.0409]	[0.0224]	[0.0375]	[0.0877]
ΔInstitutional Quality	-0.0030	-0.0349***	-0.0862***	0.0435***
	(-0.256)	(-7.451)	(-10.75)	(4.889)
	[0.0118]	[0.00469]	[0.00802]	[0.00890]
ΔSecondary School Enrollment	0.001***	1.38e-05	-0.00387***	0.0026***
	(4.459)	(0.103)	(-13.53)	(8.552)
	[0.000203]	[0.000135]	[0.000286]	[0.000303]
ΔInteraction term of dev. countries	-0.585***	-0.167***	-0.301***	-0.487***
	(-13.75)	(-15.72)	(-11.97)	(-5.587)
	[0.0426]	[0.0106]	[0.0252]	[0.0872]
ΔInteraction term of ins. quality	-0.134***	-0.0434***	-0.0589***	-0.0493**
	(-14.51)	(-9.702)	(-12.55)	(-2.278)

	[0.00925]	[0.00447]	[0.00469]	[0.0216]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.63 Pr > z = 0.0086**	**z = -2.44 Pr > z = 0.0146**	**z = -1.90 Pr > z = 0.0573**	**z = -1.96 Pr > z = 0.0499**
Arellano – Bond test for AR(2) in first differences:	**z = -1.41 Pr > z = 0.1587**	**z = -1.71 Pr > z = 0.0869**	**z = -0.96 Pr > z = 0.3357**	**z = -1.01 Pr > z = 0.3117**
Sargan test:	**$Chi^2(54)$= 43.06 Prob > chi^2 = 0.8573**	**$Chi^2(54)$= 31.76 Prob > chi^2 = 0.9932**	**$Chi^2(54)$= 43.25 Prob > chi^2 = 0.8525**	**$Chi^2(54)$= 31.33 Prob > chi^2 = 0.9943**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The model above includes time dummies. Two interaction terms are the Interaction term for financial openness and institutional quality and the interaction term for financial openness and developing country dummy that takes on a value of one for developing countries and a value of zero for advanced countries. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.9 (a): Individual financial openness measures and individual financial development measures

	Dependent Variables							
	ΔLiquid liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal bank assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	1.049***	0.660***	0.0541***	0.551***	1.004***	0.528***	0.104***	0.519***
	(551.4)	(219.6)	(102.2)	(341.5)	(327.6)	(177.6)	(800.3)	(1,545)
	[0.00190]	[0.00300]	[0.000529]	[0.00161]	[0.00307]	[0.00297]	[0.000130]	[0.000336]
ΔFDI	-0.0359***	0.0290***	0.0116***	0.141***	-0.0184***	0.0332***	0.0088*	0.0415***
	(-152.4)	(99.40)	(55.02)	(77.89)	(-38.58)	(58.49)	(1.716)	(137.8)
	[0.000235]	[0.000291]	[0.000212]	[0.00182]	[0.000477]	[0.000567]	[0.00515]	[0.000301]
ΔTrade openness	0.0645***	0.168***	-0.0303***	0.150***	0.135***	0.745***	0.372***	1.061***
	(16.52)	(20.29)	(-50.73)	(35.68)	(29.16)	(87.66)	(26.55)	(1,313)
	[0.00390]	[0.00827]	[0.000597]	[0.00420]	[0.00463]	[0.00850]	[0.0140]	[0.000808]
ΔLog GDP per capita	-2.464***	11.10***	18.38***	8.125***	-3.920***	39.92***	-46.70***	103.2***
	(-3.186)	(8.564)	(129.4)	(5.684)	(-3.099)	(39.42)	(-45.21)	(177.6)
	[0.773]	[1.296]	[0.142]	[1.429]	[1.265]	[1.013]	[1.033]	[0.581]
ΔInstitutional Quality	-3.053***	-3.675***	-1.152***	-0.911***	-7.063***	-16.31***	-13.39***	-7.296***
	(-22.92)	(-69.32)	(-33.13)	(-6.467)	(-46.21)	(-111.9)	(-53.48)	(-82.08)
	[0.133]	[0.0530]	[0.0348]	[0.141]	[0.153]	[0.146]	[0.250]	[0.0889]
ΔSecondary School Enrollment	-0.0434***	-0.0718***	0.122***	0.0014	-0.0661***	-0.0221**	-0.440***	-0.434***
	(-5.146)	(-15.11)	(95.66)	(0.356)	(-9.210)	(-1.996)	(-42.10)	(-131.1)
	[0.00843]	[0.00475]	[0.00127]	[0.00396]	[0.00717]	[0.0111]	[0.0105]	[0.00331]
Number of observations:	**371**	**379**	**354**	**344**	**382**	**391**	**391**	**391**
Number of groups:	**55**	**55**	**53**	**52**	**56**	**56**	**56**	**56**
Arellano – Bond test for AR(1) in first differences:	**z = -1.69 Pr > z =0.0907**	**z = -0.26 Pr > z = 0.7952**	**z = -0.93 Pr > z = 0.3542**	**z = 0.47 Pr > z = 0.6392**	**z = -2.12 Pr > z = 0.0341**	**z = 0.45 Pr > z = 0.6544**	**z = -1.53 Pr > z =0.1261**	**z = -1.91 Pr > z = 0.0557**
Arellano – Bond test for	**z = -2.11**	**z = -1.49**	**z = 1.07**	**z = -1.35**	**z = 1.47**	**z = -2.22**	**z = -1.04**	**z = 0.28**

AR(2) in first differences:	**Pr > z =0.0349**	**Pr > z = 0.1366**	**Pr > z = 0.2863**	**Pr > z =0.1770**	**Pr > z = 0.1427**	**Pr > z = 0.0261**	**Pr > z =0.2963**	**Pr > z = 0.7794**
Sargan test:	**$Chi^2(54)=52.65$ Prob > chi^2 = 0.5264**	**$Chi^2(54)= 49.57$ Prob > chi^2 = 0.6457**	**$Chi^2(54)=49.99$ Prob > chi^2 = 0.6298**	**$Chi^2(54)= 48.89$ Prob > chi^2 = 0.6711**	**$Chi^2(54)= 53.06$ Prob > chi^2 = 0.5108**	**$Chi^2(54)=52.38$ Prob > chi^2 = 0.5372**	**$Chi^2(54)=50.39$ Prob > chi^2 = 0.6145**	**$Chi^2(54)=53.43$ Prob > chi^2 = 0.4963**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: FDI = Foreign direct investment (% of GDP), Liquid liabilities (%of GDP), Private credit by deposit money banks and other institutions (% of GDP), The ratio of deposit money bank assets to the sum of deposit money bank assets to central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market total value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.9 (b): Individual financial openness measures and individual financial development measures

	Dependent Variables							
	ΔLiquid liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	0.723***	0.532***	0.0550***	0.507***	0.894***	0.511***	0.105***	0.463***
	(398.5)	(345.2)	(51.17)	(265.1)	(211.9)	(414.1)	(139.0)	(2,591)
	[0.00181]	[0.00154]	[0.00107]	[0.00191]	[0.00422]	[0.00123]	[0.000756]	[0.000179]
ΔInternational debt issues	0.190***	0.230***	-0.121***	0.280***	0.226***	0.0890***	0.462***	0.401***
	(70.15)	(90.63)	(-26.34)	(47.14)	(169.5)	(11.88)	(27.27)	(112.9)
	[0.00271]	[0.00253]	[0.00458]	[0.00594]	[0.00134]	[0.00749]	[0.0169]	[0.00355]
ΔTrade openness	0.0754***	0.100***	-0.0061***	0.0588***	0.0673***	0.646***	0.277***	0.948***
	(15.98)	(38.09)	(-3.422)	(9.130)	(9.224)	(42.40)	(30.34)	(430.7)
	[0.00472]	[0.00263]	[0.00179]	[0.00644]	[0.00729]	[0.0152]	[0.00912]	[0.00220]
ΔLog GDP per capita	-2.744***	-1.355	22.42***	0.112	-9.110***	49.64***	-48.54***	87.20***
	(-4.145)	(-1.024)	(88.18)	(0.0625)	(-9.495)	(30.20)	(-80.53)	(166.2)
	[0.662]	[1.324]	[0.254]	[1.796]	[0.959]	[1.644]	[0.603]	[0.525]
ΔInstitutional Quality	0.255	2.060***	-2.836***	3.933***	-2.669***	-13.09***	-1.945***	2.943***
	(1.138)	(18.65)	(-50.77)	(23.29)	(-12.08)	(-30.05)	(-5.171)	(11.46)
	[0.224]	[0.110]	[0.0559]	[0.169]	[0.221]	[0.436]	[0.376]	[0.257]
ΔSecondary School Enrollment	-0.0259***	0.0155***	0.0451***	0.0907***	0.0145***	0.0909***	-0.395***	-0.288***
	(-4.563)	(7.503)	(59.99)	(21.04)	(4.255)	(16.88)	(-37.40)	(-203.4)
	[0.00567]	[0.00206]	[0.000752]	[0.00431]	[0.00342]	[0.00538]	[0.0106]	[0.00142]
Number of observations:	**398**	**407**	**383**	**374**	**411**	**421**	**421**	**421**
Number of groups:	**56**	**56**	**54**	**53**	**57**	**57**	**57**	**57**
Arellano – Bond test for	**z = -0.02**	**z = 1.20**	**z = -0.95**	**z = 0.90**	**z = -2.18**	**z = 0.48**	**z = -1.56**	**z = -1.98**
AR(1) in first differences:	**Pr > z =0.9842**	**Pr > z = 0.2320**	**Pr > z = 0.3410**	**Pr > z = 0.3670**	**Pr > z = 0.0290**	**Pr > z = 0.6306**	**Pr > z =0.1190**	**Pr > z = 0.0479**
Arellano – Bond test for	**z = -2.23**	**z = -1.74**	**z = 1.11**	**z = -1.56**	**z = 1.64**	**z = -2.42**	**z = -1.04**	**z = 0.17**

AR(2) in first differences:	**Pr > z =0.0260**	**Pr > z = 0.0826**	**Pr > z = 0.2676**	**Pr > z =0.1780**	**Pr > z = 0.1016**	**Pr > z = 0.0157**	**Pr > z =0.2970**	**Pr > z= 0.8665**
Sargan test:	**$Chi^2(54)$=50.55 Prob > chi^2 = 0.6082**	**$Chi^2(54)$= 51.73 Prob > chi^2 = 0.0.5623**	**$Chi^2(54)$= 48.14 Prob > chi^2 = 0.6987**	**$Chi^2(54)$= 44.84 Prob > chi^2 = 0.8084**	**$Chi^2(54)$=55.32 Prob > chi^2 = 0.4246**	**$Chi^2(54)$=50.50 Prob > chi^2 = 0.6102**	**$Chi^2(54)$=53.45 Prob > chi^2 = 0.4956**	**$Chi^2(54)$=52.17 Prob > chi^2 = 0.5451**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: International debt issues (% of GDP), Liquid liabilities (%of GDP), Private credit by deposit money banks and other institutions (% of GDP), The ratio of deposit money bank assets to the sum of deposit money bank assets to central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market total value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.9 (c): Individual financial openness measures and individual financial development measures

	Dependent Variables							
	ΔLiquid liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal bank assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	0.935***	0.649***	0.842***	0.633***	1.039***	0.495***	0.109***	0.471***
	(353.1)	(272.4)	(783.5)	(199.9)	(228.4)	(204.1)	(238.7)	(2,199)
	[0.00265]	[0.00238]	[0.00107]	[0.00317]	[0.00455]	[0.00243]	[0.000459]	[0.000214]
ΔPortfolio investment flows	0.0032***	0.0715***	-0.0191***	-0.0610***	-0.117***	0.0829***	0.0372***	0.0629***
	(8.028)	(108.6)	(-19.46)	(-14.35)	(-54.08)	(72.63)	(4.871)	(30.26)
	[0.000400]	[0.000658]	[0.000983]	[0.00425]	[0.00216]	[0.00114]	[0.00764]	[0.00208]
ΔTrade openness	0.0853***	0.183***	-0.0367***	0.228***	0.155***	0.717***	0.401***	1.070***
	(11.81)	(69.06)	(-65.54)	(57.89)	(23.31)	(47.34)	(36.66)	(1,117)
	[0.00722]	[0.00266]	[0.000560]	[0.00394]	[0.00667]	[0.0151]	[0.0109]	[0.000958]
ΔLog GDP per capita	-0.0284	4.256***	3.835***	4.754***	-7.497***	46.98***	-35.98***	105.0***
	(-0.0239)	(7.658)	(35.75)	(6.441)	(-7.321)	(41.72)	(-36.20)	(288.0)
	[1.188]	[0.556]	[0.107]	[0.738]	[1.024]	[1.126]	[0.994]	[0.365]
ΔInstitutional Quality	-4.191***	-2.873***	0.839***	-0.640***	-5.622***	-14.38***	-10.83***	-7.262***
	(-28.53)	(-23.55)	(44.32)	(-6.542)	(-33.87)	(-40.02)	(-73.11)	(-51.78)
	[0.147]	[0.122]	[0.0189]	[0.0979]	[0.166]	[0.359]	[0.148]	[0.140]
ΔSecondary School Enrollment	-0.0939***	-0.0941***	0.0094***	0.0184***	-0.0341***	0.0357***	-0.491***	-0.435***
	(-9.628)	(-14.81)	(27.68)	(4.822)	(-6.356)	(3.957)	(-123.1)	(-175.9)
	[0.00975]	[0.00636]	[0.000341]	[0.00383]	[0.00537]	[0.00903]	[0.00399]	[0.00247]
Number of observations:	**395**	**403**	**376**	**366**	**406**	**414**	**414**	**414**
Number of groups:	**56**	**56**	**54**	**53**	**57**	**57**	**57**	**57**
Arellano – Bond test for	**z = -0.77**	**z = 0.06**	**z = -1.95**	**z = 0.68**	**z = -2.10**	**z = 0.38**	**z = -1.54**	**z = -1.88**
AR(1) in first differences:	**Pr > z =0.4430**	**Pr > z = 0.9527**	**Pr > z = 0.0510**	**Pr > z = 0.4969**	**Pr > z = 0.0354**	**Pr > z = 0.7016**	**Pr > z =0.1235**	**Pr > z = 0.0600**
Arellano – Bond test for	**z = -2.03**	**z = -1.73**	**z = 0.36**	**z = -1.58**	**z = 1.22**	**z = -2.19**	**z = -1.04**	**z = 0.22**

AR(2) in first differences:	**Pr > z =0.0424**	**Pr > z = 0.0836**	**Pr > z = 0.7221**	**Pr > z =0.1138**	**Pr > z = 0.2209**	**Pr > z = 0.0286**	**Pr > z =0.2968**	**Pr > z = 0.8255**
Sargan test:	**$Chi^2(54)$=50.95 Prob > chi^2 = 0.5929**	**$Chi^2(54)$= 52.60 Prob > chi^2 = 0.5285**	**$Chi^2(54)$= 51.49 Prob > chi^2 = 0.5716**	**$Chi^2(54)$= 50.89 Prob > chi^2 = 0.5949**	**$Chi^2(54)$= 55.09 Prob > chi^2 = 0.4331**	**$Chi^2(54)$=54.87 Prob > chi^2 = 0.4414**	**$Chi^2(54)$=53.23 Prob > chi^2 = 0.5042**	**$Chi^2(54)$=54.51 Prob > chi^2 = 0.4548**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: Portfolio investment flows (% of GDP), Liquid liabilities (%of GDP), Private credit by deposit money banks and other institutions (% of GDP), The ratio of deposit money bank assets to the sum of deposit money bank assets to central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market total value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.10 (a): Principal component type financial development indices and individual financial openness measures

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.603***	0.902***	0.230***	0.392***
	(88.31)	(95.77)	(345.2)	(46.45)
	[0.00682]	[0.00942]	[0.000666]	[0.00844]
ΔFDI	0.0034***	-0.0004***	0.000507***	0.0076***
	(15.46)	(-15.34)	(5.158)	(7.847)
	[0.000221]	[2.59e-05]	[9.82e-05]	[0.000974]
ΔTrade openness	0.0044***	0.002***	0.0109***	0.0080***
	(20.53)	(12.06)	(82.18)	(11.87)
	[0.000213]	[0.000166]	[0.000133]	[0.000677]
ΔLog GDP per capita	0.465***	-0.221***	0.527***	0.755***
	(13.17)	(-10.20)	(26.40)	(15.70)
	[0.0353]	[0.0217]	[0.0199]	[0.0481]
ΔInstitutional Quality	-0.0788***	-0.0847***	-0.142***	-0.0782***
	(-8.799)	(-26.95)	(-28.58)	(-3.703)
	[0.00896]	[0.00314]	[0.00496]	[0.0211]
ΔSecondary School Enrollment	-0.0004*	-0.0003***	-0.0049***	-0.0002
	(-1.683)	(-3.924)	(-36.27)	(-0.604)
	[0.000230]	[6.61e-05]	[0.000136]	[0.000329]
Number of observations:	**342**	**301**	**391**	**262**
Number of groups:	**52**	**41**	**56**	**38**
Arellano – Bond test for	**z = -1.04**	**z = -2.49**	**z = -1.88**	**z = -2.16**
AR(1) in first differences:	**Pr > z = 0.2975**	**Pr > z = 0.0129**	**Pr > z = 0.0596**	**Pr > z = 0.0309**
Arellano – Bond test for	**z = 0.92**	**z = -1.66**	**z = -0.95**	**z = -0.53**

AR(2) in first differences:	**Pr > z = 0.3563**	**Pr > z = 0.0972**	**Pr > z = 0.3445**	**Pr > z = 0.5942**
Sargan test:	**$Chi^2(54)$= 46.51 Prob > chi^2 = 0.7556**	**$Chi^2(54)$= 34.35 Prob > chi^2 = 0.9830**	**$Chi^2(54)$= 51.28 Prob > chi^2 = 0.5799**	**$Chi^2(54)$= 32.87 Prob > chi^2 = 0.9897**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively, and the figures in brackets depict the standard errors for the coefficients.*

Table 1.1.10 (b): Principal component type financial development indices and individual financial openness measures

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.668***	0.780***	0.226***	0.296***
	(125.0)	(91.54)	(296.0)	(66.57)
	[0.00534]	[0.00852]	[0.000763]	[0.00445]
ΔInternational debt issues	0.0049***	0.0029***	0.0053***	0.0108***
	(13.08)	(18.70)	(14.51)	(16.36)
	[0.000371]	[0.000156]	[0.000363]	[0.000661]
ΔTrade openness	0.0016***	0.0002	0.0096***	0.0055***
	(6.530)	(1.060)	(58.09)	(13.93)
	[0.000239]	[0.000176]	[0.000165]	[0.000392]
ΔLog GDP per capita	0.251***	-0.0977***	0.598***	0.497***
	(6.067)	(-4.865)	(27.58)	(10.55)
	[0.0413]	[0.0201]	[0.0217]	[0.0471]
Δ Institutional Quality	-0.0077	-0.0368***	-0.0386***	0.0629***
	(-1.010)	(-9.382)	(-5.404)	(4.003)
	[0.00761]	[0.00392]	[0.00714]	[0.0157]
ΔSecondary School Enrollment	0.0015***	0.0006***	-0.0042***	0.0037***
	(9.834)	(8.425)	(-18.33)	(14.33)
	[0.000155]	[6.88e-05]	[0.000230]	[0.000258]
Number of observations:	**371**	**318**	**421**	**276**
Number of groups:	**53**	**41**	**57**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -1.05 Pr > z = 0.2924**	**z = -2.29 Pr > z = 0.0222**	**z = -1.94 Pr > z = 0.0523**	**z = -1.97 Pr > z = 0.0494**
Arellano – Bond test for	**z = 0.87**	**z = -2.06**	**z = -1.00**	**z = -0.59**

AR(2) in first differences:	**Pr > z = 0.3865**	**Pr > z = 0.0390**	**Pr > z = 0.3181**	**Pr > z = 0.5545**
Sargan test:	**$Chi^2(54)$= 51.89 Prob > chi^2 = 0.5561**	**$Chi^2(54)$= 33.05 Prob > chi^2 = 0.9891**	**$Chi^2(54)$= 54.86 Prob > chi^2 = 0.4419**	**$Chi^2(54)$= 35.89 Prob > chi^2 = 0.9726**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.10 (c): Principal component type financial development indices and individual financial openness measures

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.962***	0.903***	0.221***	0.385***
	(63.78)	(86.65)	(434.8)	(41.06)
	[0.0151]	[0.0104]	[0.000509]	[0.00938]
ΔPortfolio investment	-0.0061***	-0.001***	0.0007*	0.0068***
	(-17.50)	(-5.218)	(1.921)	(12.19)
	[0.000349]	[0.000132]	[0.000356]	[0.000556]
ΔTrade openness	0.0013***	0.0018***	0.0118***	0.0110***
	(3.057)	(24.72)	(121.6)	(18.67)
	[0.000419]	[7.11e-05]	[9.73e-05]	[0.000590]
ΔLog GDP per capita	-0.0703***	-0.219***	0.584***	0.612***
	(-4.080)	(-9.552)	(62.51)	(9.003)
	[0.0172]	[0.0229]	[0.00935]	[0.0680]
ΔInstitutional Quality	-0.0207*	-0.065***	-0.103***	-0.0737***
	(-1.798)	(-17.15)	(-16.06)	(-5.133)
	[0.0115]	[0.00379]	[0.00639]	[0.0144]
ΔSecondary School Enrollment	0.0004**	-4.36e-05	-0.0054***	-0.0009***
	(2.333)	(-0.473)	(-28.97)	(-4.697)
	[0.000188]	[9.24e-05]	[0.000186]	[0.000200]
Number of observations	**364**	**316**	**414**	**275**
Number of groups:	**53**	**41**	**57**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.88 Pr > z = 0.0040**	**z = -2.48 Pr > z = 0.0132**	**z = -1.88 Pr > z = 0.0598**	**z = -2.09 Pr > z = 0.0367**
Arellano – Bond test for	**z = -1.73**	**z = -2.10**	**z = -0.96**	**z = -0.77**

AR(2) in first differences:	**Pr > z = 0.0840**	**Pr > z = 0.0356**	**Pr > z = 0.3348**	**Pr > z = 0.4387**
Sargan test:	**$Chi^2(54)$= 51.27 Prob > chi^2 = 0.5803**	**$Chi^2(54)$= 34.36 Prob > chi^2 = 0.9829**	**$Chi^2(54)$= 52.91 Prob > chi^2 = 0.5166**	**$Chi^2(54)$= 35.37 Prob > chi^2 = 0.9766**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.11: Principal component type financial openness and financial development indices, fixed effects in levels

	Dependent Variables			
	Banking sector development	**Bond market development**	**Stock market development**	**Financial development**
Dependent variable (Lagged)	0.935***	0.965***	0.299***	0.607***
	(36.73)	(34.38)	(6.135)	(11.06)
	[0.0255]	[0.0281]	[0.0487]	[0.0549]
Financial openness	0.068*	0.0098	0.059	0.212***
	(1.834)	(0.520)	(1.124)	(3.704)
	[0.0372]	[0.0189]	[0.0528]	[0.0572]
Trade openness	-0.004***	-0.0004	0.0063**	-0.0032
	(-2.868)	(-0.838)	(2.542)	(-1.496)
	[0.00121]	[0.000481]	[0.00247]	[0.00210]
Log GDP per capita	0.252	-0.105	-0.770*	-0.341
	(1.301)	(-1.159)	(-1.707)	(-1.015)
	[0.194]	[0.0907]	[0.451]	[0.336]
Institutional Quality	0.047	-0.0538***	0.136	0.081
	(1.238)	(-2.637)	(1.242)	(1.276)
	[0.0376]	[0.0204]	[0.109]	[0.0637]
Secondary School Enrollment	-0.0002	0.0003	-0.007**	-0.006
	(-0.137)	(0.409)	(-2.039)	(-0.300)
	[0.00137]	[0.000613]	[0.00324]	[0.00213]
Number of observations	**409**	**365**	**463**	**320**
R-squared	**0.990**	**0.994**	**0.851**	**0.976**

***Notes**: All regressions are estimated using fixed effects with country and year effects which are not reported here. The indices are constructed following the principal component methodology that utilizes all components. The model above includes country and time dummies. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1.1.12: Principal component type financial openness and financial development indices with global degree of financial development

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.842***	0.814***	0.0972***	0.0904***
	(72.46)	(91.00)	(58.61)	(6.430)
	[0.0116]	0.00895	0.00166	0.0141
ΔFinancial openness	0.0885***	0.0876***	0.0123*	0.467***
	(6.789)	(19.28)	(1.740)	(27.18)
	[0.0130]	0.00454	0.00708	0.0172
ΔTrade openness	0.00162***	0.000547***	0.00631***	-0.00128
	(4.573)	(2.967)	(17.76)	(-1.501)
	[0.000354]	0.000184	0.000355	0.000850
ΔLog GDP per capita	0.0861*	-0.174***	-0.953***	-0.139
	(1.795)	(-6.351)	(-14.83)	(-1.321)
	[0.0480]	0.0274	0.0642	0.105
ΔInstitutional Quality	-0.0148	-0.0478***	-0.0305**	0.0607***
	(-1.563)	(-9.562)	(-2.136)	(2.776)
	0.00947	0.00500	0.0143	0.0219
ΔSecondary School Enrollment	0.00100***	7.04e-05	-0.00363***	0.00232***
	(6.337)	(0.538)	(-6.113)	(3.788)
	0.000158	0.000131	0.000594	0.000611
Δ Global degree of financial development	0.0244**	0.0113***	0.874***	0.558***
	(2.060)	(3.444)	(59.44)	(17.22)
	0.0119	0.00329	0.0147	0.0324
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**

Arellano – Bond test for AR(1) in first differences:	**z = -2.46 Pr > z =0.0138**	**z = -2.39 Pr > z =0.0169**	**z = -1.73 Pr > z =0.0845**	**z =-1.27 Pr >z=0.2057**
Arellano – Bond test for AR(2) in first differences:	**z = -1.45 Pr > z =0.1417**	**z = -1.68 Pr > z=0.0929**	**z = -1.22 Pr > z=0.2217**	**z =-1.17 Pr >z=0.2423**
Sargan test:	**$Chi^2(54)$ = 43.29 Prob > chi^2 = 0.8515**	**$Chi^2(54)$ = 37.39 Prob > chi^2 = 0.9585**	**$Chi^2(54)$ = 52.50 Prob > chi^2 = 0.5326**	**$Chi^2(54)$ = 32.59 Prob > chi^2 = 0.9907**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The global degree of financial development is calculated as:*

$$Global\ degree\ of\ financial\ development_t = \sum_i FD_{i,t} \frac{GDP_{i,t}}{\sum_i GDP_{i,t}}$$

$GDP_{i,t}$ is the Gross domestic product of countries in 2000 constant US dollars (WDI database) and $FD_{i,t}$ is the principal components financial development index. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.

CHAPTER 2

Financial Harmonization and Industrial Growth: Evidence from Europe

Abstract

This paper analyzes the growth effects of the Financial Services Action Plan (FSAP) of the European Commission, a set of measures and directives that aim to harmonize European financial markets. Using a panel of 25 countries and 30 industries, we find that the standard specification predicts harmonization to lower growth, though the negative effect is mitigated for industries that depend more on external finance. We then show that this seemingly surprising result is due to omitted variable bias. We would expect early adopters to bear more of the costs and experience less of the benefits of harmonization. Once we control for the relative timing of adoption, harmonization is shown to have a positive effect on growth. This finding is robust to including further controls, splitting up the sample into different groups of countries, and extending the model to a dynamic setting.

2.1 Introduction

The European Union, with the hopes of integrating countries and creating a unified European financial market has taken two important measures over the last two decades. The first, well known, measure is of course the introduction of the Euro. Since its establishment in 1999, the Euro has not only grown to be a leading currency in the world's financial markets, but has also greatly contributed to unifying European financial markets. The second, less well known, measure is the so-called Financial Services Action Plan (FSAP), aimed at harmonizing European financial markets through the imposition and adoption of regulatory and legislative frameworks. With the strategic objectives of ensuring "a single EU market for wholesale financial services", creating "open and secure retail markets, and state-of-the-art prudential rules and supervision" and establishing "wider conditions for an optimal single financial market", the FSAP intends to harmonize and reduce the costs of cross-border financial intermediation and transactions. (Hartmann, Maddaloni, and Manganelli, 2003, 34; Kalemli-Ozcan, Papaioannou, and Peydro, 2010 a).

The European Commission has argued that financial harmonization, by reducing the cost of cross-border financial business, should increase economic growth (FSA, 2003; London Economics, 2002). However, no in-depth study of the outcomes of the FSAP has been undertaken. Therefore, an important question remains to be examined: how effective have these FSAP measures been on growth across countries and industries? This paper aims to answer this question. When analyzing the effect of FSAP on growth, we will take an industry perspective. Given that different industries depend on external finance in varying degrees, it is likely that the impact of FSAP on growth will be industry-dependent. We therefore examine the effects of financial harmonization policies of the FSAP on industrial growth in a panel of twenty five EU member states and thirty industries for the period of 1971 – 2007.

Based on the view of the European Commission, we would expect harmonization to have a positive impact on growth rates across industries and countries. In contrast, when regressing growth on financial harmonization, we find a negative impact. However, we do find the negative effect to be mitigated in industries that depend more on external finance. In principle, the negative effect of harmonization on growth may be due to different reasons. First, while harmonization may refer to integration, thus lowering the cost of cross-country financial activity, it may also refer to uniformity, often implying adoption costs without clear benefits. For example, Boyfield, Robinson and Mullally (2006) have reported that the additional costs faced by the British economy after the implementation of the FSAP measures amounted to more than 14 billion pounds. We therefore classify the different directives of the FSAP into those that mainly are aimed towards uniformity, those that are mainly aimed towards integration, and those that do not fall under either category. Consistent with our prior, the directives that focus on uniformity continue to have a significant negative effect, while those that focus on integration cease to have a significant effect.

Second, the timing in the adoption of the FSAP directives may be crucial in determining their effects on growth. In particular, being an early adopter may not be advantageous, because the country would bear the costs of adoption, without reaping the benefits of harmonization, since the other countries would be lagging behind. Controlling for the relative timing of adoption in our estimations, we find that harmonization now has a beneficial effect on growth. In addition, we find evidence of early adoption having a negative impact on growth. We then carry out a number of robustness checks to examine whether our main result --- harmonization having a positive effect on growth and the relative timing of adoption having a negative effect --- holds up. The results are mostly robust to splitting up our sample into EU-15, Euro and non-EU 15 countries, and to introducing additional control variables, such as legal

and governmental measures, and financial and stock market development indicators. We lastly analyze the consistency of our benchmark model through the use of a dynamic panel GMM model. The dynamic Arellano – Bond model derives similar conclusions reporting that harmonization is positively significant on industrial growth when the harmonization difference measure is included in the estimations.

Our paper is related to different strands of the literature. First is the literature that has examined the effect of deregulation on growth and volatility. For example, Jayaratne and Strahan (1996, 1998) and Strahan (2002) study the impact of branching deregulation and interstate banking on growth. The results reveal that following state-level branching deregulation, real per-capita economic growth across the U.S. states increased significantly. Policy changes that allow for higher integration, better bank monitoring and screening across states are found to be a possible explanation. In a more recent study, De Avila (2010), examining the effects of financial deregulation in Europe, shows that the process of capital control lifting and the harmonization of banking laws have enhanced the growth rates of European economies. Harmonization is found to be beneficial for growth through the increase in the level and efficiency of financial intermediation, whereas the liberalization of capital controls increased growth through improvements in financial intermediation. Different from our study, De Avila (2010) is limited to a cross-country analysis, therefore not taking into account cross-industrial variation. In addition, his focus is on the European Commission directives on banking integration that were established prior to the FSAP.

Second is the literature that has analyzed the link between external finance dependence and growth. An important paper is Rajan and Zingales (1998) which studies the role of external finance on industrial growth. The authors find financial development to be an influential factor on the rate of growth of industries by reducing the cost of external finance. This effect is especially stronger in those firms with greater financial dependence. Rajan and Zingales (1998) show that industries which require higher levels of external finance develop faster in countries with more established financial markets. Similarly, Gupta and Yuan (2003), using the Rajan and Zingales external finance dependence measure, demonstrate that stock market liberalizations lead to higher growth rates in industries that depend more heavily on external finance. Given this evidence, we are interested in seeing whether the benefits of financial harmonization are greater in those industries with greater external finance dependence. Our analysis thereby brings together the literatures on financial deregulation and external finance dependence.

Third, there are some papers that have studied the FSAP measures. Kalemli – Ozcan, Papaioannou, and Peydro (2010 a) analyze the link between financial integration and business cycle synchronization. The authors' analysis, using bilateral panel instrumental variables to link legislative harmonization policies to output synchronization, depicts a negative relationship for the country-pairs selected in the sample. In an attempt to examine the Euro's effect on financial integration Kalemli – Ozcan, Papaioannou, and Peydro (2010 b) reveal the legislative-regulatory harmonization policies in financial markets established under the FSAP to be a contributing factor for cross-border lending, despite these policies' inability to explain the Euro's impact on financial integration. Neither of these papers assesses the impact on growth, and neither uses industrial data.

Compared to the existing literature, one important finding is that controlling for the relative timing of adoption is essential. Clearly, adopting harmonization measures when others do not, does not amount to true harmonization. We would expect early adopters to face more of the costs and less of the benefits in comparison to late adopters. Our results indicate that not controlling for the relative timing of adoption leads to a serious omitted variable bias. Indeed, failing to control for this important variable changes the impact of harmonization on growth from positive to negative.

The rest of the paper is structured as follows. In the next section we explain in detail our data. Section 3 provides a discussion of the empirical model. Section 4 depicts our results and some robustness checks. Section 5 concludes.

2.2 Data

The data used in this paper come from a variety of sources. Our panel consists of annual industry-level data from twenty-five European economies over the period 1970 – 2007. The countries used in our analysis are Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.[1] Below we discuss the indicators employed in the analysis in further detail.

2.2.1 Measure of Industrial Growth

The industrial data for growth come from the EU KLEMS Growth and Productivity Accounts dataset. This dataset provides industrial data for 25 EU member countries for 107 different industries (sectors). Having industry-level data is essential for exploiting cross-industrial variation in external finance dependence, while having cross-country variation is important in identifying the effects of harmonization on growth. The time period covered in the EU KLEMS dataset is 1970 – 2007 for EU 15 countries and 1995 – 2007 for 10 new EU member states. From the EU KLEMS dataset we use gross value added in constant Euros.[2] Gross value added growth in country *i*, industry *s*, and time *t*, is defined as:

$$GVAGRO_{i,s,t} = \log\left(GVA_{i,s,t}\right) - \log(GVA_{i,s,t-1})$$

where $GVA_{i,s,t}$ is gross value added in country *i*, industry *s*, and time *t*.[3]

2.2.2 Measure of Financial Harmonization

Harmonization measures used in our analysis are based on the information from the Financial Services Action Plan. The Financial Services Action Plan (FSAP) was launched by the European Union and the European Commission at the end of 1998 as a major 5-year program with the goals of establishing "a single EU wholesale market for financial services, open and secure retail markets, and state-of-the-art prudential and supervisory regulations." (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 b, 79). A single wholesale market should in principle allow for higher levels of finance to be raised across the EU, while open and secure retail financial services markets should provide customers with a safer and cheaper integrated financial market that reduces charges on cross-border payments, removes barriers to retail

[1] Our panel has three dimensions; countries (I), industries (sectors) (S), and time (T). We, therefore, have I*S*T, i.e. 25*107*37 = 98975 observations. Due to missing observations for the external finance measure of Rajan and Zingales (1998) we drop some sectors from our analysis. Thus, most of our regressions are estimated with a sample of 17380 observations.

[2] For the time period before the introduction of the Euro, the EU KLEMS uses the 1999 official fixed Euro exchange rates of the Euro countries to convert local currencies into Euros. Consistent with this, for the non-Euro countries for the time period before the introduction of the Euro, we take the 1999 official fixed Euro exchange rates with the local currencies to convert them into Euros. For further information please refer to Table 2.1 in the Appendix.

[3] While most of the growth literature focuses on log differences to approximate growth rates, the deregulation literature often uses the direct ratio of $GVA_{i,s,t}/GVA_{i,s,t-1}$. We have experimented with this alternative measure, and the results do not qualitatively change.

financial services, and allows a larger scale of electronic commerce to take place across the EU (HM Treasury, The Financial Services Authority, and the Bank of England, 2004). State-of-the-art prudential rules and supervision, on the other hand, should offer faster changes in the regulatory environment that benefit customers in financial services.

Broadly speaking, the FSAP is aimed at removing barriers to entry into the financial sector, increasing competition, and harmonizing information (Malcolm, Tilden, and Wilsdon, 2009). However, just like any other legislative measure taken at the country level, the FSAP comes with costs and benefits. Boyfield, Robinson and Mullally (2006) state that the benefits involve increasing investment opportunities in securities markets across borders, easing the framework for investment firms, augmenting internalization, stimulating competition between banks and thereby reducing the cost of trading and the cost of capital, increasing investor confidence, market liquidity, and free flow of capital, allowing for more transparency, and greater competition. The costs on the other hand entail compliance costs due to complexity, possibility of creating barriers to entry for smaller firms, further costs that involve execution of the directives, and costs of implementation of these directives across countries. The goal of the European Commission through the FSAP is to form a unified financial market that can act as an essential element for growth, employment and improved competition in the overall European system (European Commission, 2005). If so, the Financial Services Action Plan (FSAP) should have had a positive impact on growth, and one of the aims of this study is to explore whether this is indeed the case.

The FSAP consists of 29 legislative acts, 27 directives and 2 regulations in corporate law, banking, payment systems and corporate governance (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a). The most important of these are the 27 directives, which will be the focus of the remainder of our analysis. The directives amend previous laws, replace out-of-date proposals or offer new legislative measures for the EU member countries. Since the establishment of the FSAP in 1998, the European Commission has passed 21 out of the 27 directives by the end of 2003, with the remaining 6 directives being passed into legislation during the period of 2004 – 2006 (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a).

Unlike the EU regulations that are enforceable across countries immediately after their announcement, the FSAP directives are enforceable only after the member states pass legislations that adopt the EU law domestically (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a). The implementation stage of the FSAP directives involves the European Commission's proposal on legislative directives and regulations, which then will have to be adopted by "co-decision" of the Council of Ministers of the Member States and the European Parliament (HM Treasury, The Financial Services Authority, and the Bank of England, 2003). The FSAP directives are incorporated into the national law of each EU member state either through introduction or through amendment of national laws within a time frame of 18 to 24 months of their date of original publication. The implementation process of the FSAP directives works through three stages; transposition of the EU legislation into national law, adjustment for necessary arrangements and ensuring that the newly adopted regulations are working effectively and efficiently. Due to differences across countries in modifying their existing internal institutional structures and frameworks to adopt the EU law (and due to the discretion in when to adopt these directives), the transposition of the FSAP directives may take several years, creating variation in terms of the dates of implementation of these directives in different countries.[4] For example, the 1998 Settlement Finality Directive (1998/26/EC) of the FSAP under

[4] The member states are given a time frame to transpose the directives into national law. However, some countries do not follow the timing of the FSAP directives that is set by the European Commission. This could occur due to parliamentary delays, oppositions from firms and businesses within the countries, difficulty in removal or alteration of existing laws, and possible technical obstacles. There are sanctions, however, to ensure compliance of

the securities category was implemented into domestic law in Austria, Belgium, Finland, Germany, Ireland, the Netherlands, Spain and the U.K. within a year of its circulation. However, France, Italy and Luxembourg did not adopt this directive until 2001, while Cyprus, Czech Republic, Hungary, Latvia, Lithuania and Poland had not transposed the directive till the end of our sample period (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a, b).[5] It is this cross-country variation in the timing of the adoption of different directives which will allow us to identify their effect on growth.

We assemble harmonization indices for EU countries using adoption dates of different directives in different countries from the European Commission's Financial Services Action Plan. Following the methodology by Kalemli – Ozcan, Papaioannou, and Peydro (2010 b), we construct country and time-variant and industry-invariant indices of harmonization that summarize the information provided by the 27 FSAP directives. In particular, for each of the 27 directives listed under the FSAP we define a dummy variable that takes on a value of one on and after the date that the country under examination has transposed the directive into national law and a value of zero otherwise. We sum all 27 directives to create our next variable, $lex_{i,t}$ (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a, b):

$$lex_{i,t} = \sum_{k=1}^{27} Directives_{i,t}^{k}$$

We construct our financial harmonization index by:

$$Harmonization_{i,t} = \ln(1 + lex_{i,t})$$

where *k* represents all 27 directive dummies, *i* represents the countries, and *t* represents the years in the sample. Following Kalemli – Ozcan, Papaioannou, and Peydro (2010 b), we use the logarithmic transformation of the sum of the directives for countries. For robustness we construct two different indices that include the initial twenty-one directives that were put into force by the European Commission before the official completion of the FSAP, and the six directives that correspond to the banking initiatives of the FSAP (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 b).[6] Table 2.2 in the Appendix provides a time-line of adoption of the 27 directives for all countries in our sample, while Table 2.3 presents the descriptions and categories for these directives.

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the member states with the adoption of the directives. By the former Article 171 (now Article 228) of the European Treaty and Article 143 of the Euratom Treaty the European Commission can impose tailored sanctions depending on the severity of non-compliance of the Member States with the rules and regulations. For more information please refer to the European Commission's Application of EU Law website, http://ec.europa.eu/eu_law/infringements/infringements_260_en.htm

[5] Please refer to Table 2.2 in the Supplementary Appendix for further explanation of the directives in the Financial Services Action Plan.

[6] The first alternative harmonization index which includes twenty one directives excludes the directives implemented prior to 2004. It is constructed as: $lexro_{i,t} = \sum_{k=1}^{21} Directives_{i,t}^{k}$ and $Harmonization_{i,t}^{*} = \ln(1 + lexro_{i,t})$. The second alternative to the harmonization index highlights the importance of the 7 banking directives of the FSAP. The banking harmonization index is then formed as: $banklex_{i,t} = \sum_{k=1}^{7} Directives_{i,t}^{k}$ and $Harmonization_{i,t}^{**} = \ln(1 + banklex_{i,t})$.

2.2.3 Measure of External Finance Dependence

One of the aims of our model is to examine how the effect of harmonization on growth is mediated by an industry's dependence on external finance. Following Rajan and Zingales (1998), we take a measure of an industry's dependence on external funds in the U.S. and apply it to our European sample. The external finance dependence measure is calculated by computing the external financing needs of U.S. companies during 1970s using data from Compustat. It exclusively concentrates on the amount of desired investment that cannot be financed through internal cash flows within the same company. The external finance dependence measure for a firm is constructed as:

$$exffirm_{s,t} = \frac{capexp_{s,t} - cfo_{s,t}}{capexp_{s,t}}$$

where $exffirm_{s,t}$ is the external finance dependence measure, $capexp_{s,t}$ is capital expenditures, and $cfo_{s,t}$ is cash flow from operations of a firm in industry *s*. In order to obtain the firm's overall dependence on external finance in 1970s Rajan and Zingales sum the external finance measure over 10 years (from 1970 to 1980) and divide it by the sum of capital expenditures over the same period. To obtain a measure of finance dependence at the sectoral level, exf_s Rajan and Zingales (1998) use the industry median. By doing so, they reduce the effects of outliers and temporal fluctuations.

Applying the U.S. industry measures of external finance dependence to the corresponding European industries is reasonable if, as argued by Rajan and Zingales (1998), there is a technological reason for why some industries depend more on external finance than others. That is, if the machinery industry requires a larger initial scale and a longer period of gestation before the admittance of cash flows into the sector, in comparison to the textile industry in the U.S., this would also be true for the two industries in France (Rajan and Zingales, 1998). With the assumption that these technological differences are similar across countries, the Rajan and Zingales measure of external finance dependence can be used for different countries.

We use the external finance measure of Rajan and Zingales (1998) for two additional reasons.[7] Firstly, we rely our analysis on a well cited paper by Rajan and Zingales. Secondly, if we were to use country-specific measures of finance dependence for Europe, there would be an issue of endogeneity, because growth may affect external dependence. By using the U.S. measure, external finance dependence becomes exogenous to the growth process of different European countries.

There is, nonetheless, a drawback of using this measure. Our sample includes a larger group of industries than what the Rajan and Zingales measure captures.[8] Although this leads to the exclusion of some industries from our estimations, we have no reason to believe that it substantially alters our results.

[7] A number of studies in the literature employ the Rajan and Zingales measure of external finance due to its exogeneity. Gupta and Yuan (2003), (2009), Claessens and Laeven (2005), Guiso et al. (2004), Cetorelli (2001) and Cetorelli and Gambera (2001) are some examples.

[8] The Rajan and Zingales measure of external finance dependence is based on the information obtained using mostly manufacturing sectors. Table 2.1 in the Supplementary Appendix presents correspondences of industries in our analysis to the ones in Rajan and Zingales (1998).

2.2.4 Interaction term of the harmonization index and external finance dependence

Given our harmonization index and the external finance dependence measure of Rajan and Zingales (1998), we construct our interaction term which will help us to identify the simultaneous effect of harmonization and external finance dependence on growth as follows:

$$(Harmonization_{i,t} \times exf_s)_{i,s,t}$$

where *i* represents the countries, *s* represents the industries, *t* represents the years in the sample,[9] $Harmonization_{i,t}$ is the harmonization index constructed using the directives of the FSAP and exf_s is the industry-variant external finance dependence measure of Rajan and Zingales.

With the interaction term that has country, industry and time variability, we account for the effects of harmonization on industries that require external financing on growth rates.

2.2.5 Other control variables

In order to thoroughly examine the relationship between financial harmonization and industrial growth, there may be a need to control for a number of legal and institutional variables, as well as financial and stock market development indicators. Control variables described in detail below are country and time-variant and cover the period of 1996 – 2007.

We employ a series of legal and institutional variables from the World Bank's Worldwide Governance Indicators dataset. We use three different measures to control for institutional, legal, political and economic factors that may affect the overall level of growth. The three indicators --- *government effectiveness*, *regulatory quality,* and *rule of law* --- are constructed using subjective and perceptions-based data that reflect views of a range of respondents, agencies and organizations. They are measured in a range from -2.5 to 2.5, where higher values correspond to better governance outcomes.[10]

To measure financial development we employ *the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets* from Beck, Demirguc-Kunt and Levine's (2000) Financial Development and Structure Database. This variable demonstrates the weight of deposit money bank assets among total assets and indicates the importance of private lending. For stock market development we make use of *stock market turnover ratio* also from the Financial Development and Structure Database. This variable is measured as the ratio of the value of total shares traded to stock market capitalization and depicts the efficiency of stock markets in transaction.

Control variables help in further explaining the effect of harmonization on industrial growth. The timing of implementation of harmonization policies could be driven by the state of financial and stock market developments across countries. The ease in adopting FSAP directives into national law can be induced by

[9] Similarly for robustness checks we construct two additional interaction terms that depend on the different harmonization indices, i.e $\left(Harmonization^{*}_{i,t} \times exf_s\right)_{i,s,t}$ and $\left(Harmonization^{**}_{i,t} \times exf_s\right)_{i,s,t}$

[10] Please refer to the Worldwide Governance Indicators (WGI) dataset. 1996 – 2011. World Bank. http://info.worldbank.org/governance/wgi/resources.htm. The institutional quality variables used in our analysis do not fluctuate widely across time. Due to the relatively small fluctuation structure of these indicators, we take the averages of two consecutive years to replace the missing years' data for these three legal/institutional variables.

the quality of regulatory and legislative institutions. In order to control for these potential influences, to verify the robustness of our benchmark model, to analyze the possibility of extending our model to a dynamic one, and to account for factors that may not be fully encountered in a fixed effects setting, we include the variables discussed above.

2.3 Empirical Specification

Our analysis is based on a model that measures the effects of financial harmonization and external finance dependence on industrial growth. We follow the literature (Jayaratne and Strahan (1996), (1998), Strahan (2002), Morgan, Rime and Strahan (2004), and Kalemli – Ozcan, Papaioannou, and Peydro (2010 a, b)) and use a model which assumes that the effects of harmonization and external finance dependence will impact growth not only through the harmonization index but also through the interaction term.[11] Our benchmark model will control for average differences across countries and time in harmonization policies and across industries in external finance dependence. It will allow us to analyze the influence of harmonization policies through the index measure and through the interaction term separately.

We present a benchmark model to measure the effect of external finance dependence and financial harmonization on industrial growth across countries and over time.

$$GVAGRO_{i,s,t} = \lambda_i + \mu_s + \theta_t + \varphi GVA_{i,s,t-1} + \beta_1 Harmonization_{i,t} + \beta_2 (Harmonization_{i,t} \times exf_s)_{i,s,t} + v_{i,s,t}$$

where the dependent variable in the above equation is gross value added growth, λ_i represents country fixed effects, μ_s represents industry fixed effects, θ_t represents time fixed effects, $GVA_{i,s,t-1}$ is the lagged logarithm of gross value added in levels, $Harmonization_{i,t}$ is the index measure created using the FSAP directives, and the interaction term is the product of the financial harmonization index and the external finance dependence measure of Rajan and Zingales.[12]

In the above equation our main focus is on the coefficients of the harmonization index and the interaction term. We would expect to find positive and significant coefficients for both terms which would imply a positive effect of financial harmonization and financial deepening (measured by external finance dependence) on gross value added growth. Our analysis is based on the examination of how much industries benefit in terms of growth from harmonization of financial markets within the EU given that these industries require external finance. Similar to the work presented in Rajan and Zingales (1998), we can make predictions about within country differences between industries and across time using an interaction term that reveals time, country and industry specifics. This method allows correcting for country, industry, and time characteristics and avoids any potential omitted variable bias and model specification (Rajan and Zingales, 1998).

Although the literature (Jayaratne and Strahan (1996), (1998), Strahan (2002), and Kalemli – Ozcan, Papaioannou, and Peydro, 2010 b) does not suggest the use of a dynamic model, there are studies that

[11] We extend our benchmark model into an Arellano-Bond type dynamic panel data model to control for issues regarding endogeneity and autocorrelation.

[12] The above model in levels with fixed effects is consistent when $cov(GVA_{i,s,t-1}, v_{i,s,t-1}) = 0$. This implies lag of gross value added to have no correlation with the lag of the error term. This does not however suggest lagged growth rate to be uncorrelated with the lagged error term. That is, $cov(\Delta GVA_{i,s,t-1}, v_{i,s,t-1}) \neq 0$. This assumption is sufficient to guarantee the efficiency of our benchmark model.

examine whether the results of the benchmark model correspond to those using instruments in estimations. In our benchmark setting, there may also be concerns regarding the effect of anticipation of financial harmonization policies. That is, countries may initiate adopting harmonization measures with hopes of enhancing growth. In order to account for this possibility, we extend our analysis to include a dynamic specification. Using a dynamic setting, we can calculate the speed of adjustment of the harmonization policies as well as accounting for long-run effects of the variables in our model. The dynamic panel data model used in our analysis is specified as follows[13]:

$$\Delta GVAGRO_{i,s,t} = \gamma \Delta GVAGRO_{i,s,t-1} + \Delta\tau_t + \alpha_1 \Delta Harmonization_{i,t} + \alpha_2 (\Delta Harmonization_{i,t} \times \Delta exf_s)_{i,s,t} + \sum_{k=1}^{6} \rho_k \Delta Controls_{i,t,k} + \Delta u_{i,s,t}$$

where $GVAGRO_{i,s,t}$ is the country, industry and time-variant gross value added growth, τ_t represents the time fixed effects, $Harmonization_{i,t}$ is the harmonization index of the FSAP measures, the interaction term is the product of the harmonization index and external finance dependence measure of Rajan and Zingales, and $Controls_{i,t,k}$ are control variables for harmonization differences, financial and stock market development, and legal and institutional measures that are country and time-variant. As before, we would expect to find positive values for both α_1 and α_2.

The above model no longer has country or industry specific effects, the dynamic panel data model accounts for these individual effects. The Arellano-Bond dynamic panel data model takes the first differences of all terms in order to elude the Nickell bias that occurs when the lagged dependent variable is correlated with the error term. The moment conditions that stem from the above model require that:

$$E\left[GVAGRO_{i,s,t-k} \Delta u_{i,s,t}\right] = 0 \text{ for } \forall k \geq 2$$

With this condition the lagged dependent variable of gross value added growth is guaranteed to be uncorrelated with the first difference of the error term even though the first difference of the dependent variable could indeed be correlated with the first difference of the error term.

By using one lag of the dependent variable as a regressor, we allow gross value added growth rates across European countries to partially adjust to their long-run equilibrium value within one year. First differences in the dynamic data model wipe out country and industry-variant and time-invariant specific effects. The dynamic panel data model thereby avoids any potential correlation of possible fixed effects with the right hand side regressors. We convey our main findings for both the benchmark and dynamic panel data models in detail in the next section.

2.4 Results

We report our results using 25 EU member countries for 1971 – 2007. In our regressions with the benchmark model we use fixed effects estimations with country, industry, and time specific effects, whereas for the dynamic panel data model we use the Arellano-Bond dynamic panel specification.

[13] We include time dummies in our dynamic panel data model to account for possible trends. Time dummies are also used as IV type instruments in the dynamic panel data model estimations.

2.4.1 Benchmark model

The results from Table 2.5 illustrate the effects of the harmonization index and the interaction term on gross value added growth in a fixed effects estimation with country, industry, and time effects. We would expect to find a positive effect of financial harmonization and the interaction term on growth. Previous discussions had conveyed that through the Financial Services Action Plan, European economies would achieve an increase in the real GDP by 1.1% over a decade (FSA, 2003; London Economics, 2002). However, columns (1) – (3) of Table 2.5[14], each using a different harmonization index depending on the number of directives included, report negative coefficients for harmonization on gross value added growth.[15] This implies that as countries adopt the directives of the FSAP, industrial growth becomes negatively impacted directly by the process of financial harmonization. Although the negative impact is only statistically significant for banking integration directives in column (3), this finding clearly runs counter to our initial expectations. The aim of the FSAP is to create policies that will be implemented by member countries to achieve an optimal single financial market. Nevertheless, interaction terms constructed using different financial harmonization indices, are found to be positive and significant. They convey that the additional need for external finance dependence along with the adoption of harmonization policies bring an enhancement to growth. The lagged values of gross value added are shown to be negatively significant in all columns complying with our initial expectations that European countries experience slower growth perspectives in upcoming years.

Given that harmonization has a negative direct effect and a positive indirect effect (through the interaction term), we move on to calculating the total effects of harmonization. This can be done by using the following partial derivative:

$$\frac{\partial GVAGRO_{i,s,t}}{\partial Harmonization_{i,t}} = \beta_1 + \beta_2 exf_s$$

Since our primary concern is on the impact of harmonization policies implemented through the FSAP, we observe total effects using the above equation. Examining the summary statistics reported in Table 2.4 and the coefficients from the first column of Table 2.5, we calculate that at the mean level of external finance dependence, the partial derivative of gross value added growth across industries with respect to the harmonization index is equal to -0.0094. At the minimum level of external finance dependence, the partial derivative takes on a value of -0.0148, whereas at the maximum level of external finance dependence, the partial derivative is -0.0027. The results show that the total effect of harmonization policies is negative for growth. The positive interaction terms simply convey that the negative effect of harmonization policies is somewhat mitigated in industries with higher external finance dependence. The coefficient of harmonization from column (3) of banking directives implies that growth across countries and industries has decreased by 2 % after the implementation of the FSAP directives (exp (-0.025) =0.9753).

[14] In this benchmark specification we do not control for other covariates; the inclusion of country, industry and time fixed effects accounts for most of the usual control variables used in standard growth regressions. We introduce further controls to our model in later specifications.

[15] The t-statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation. Country and industry clustering allows to control for errors that can be correlated across countries within an industry, and across industries within a country, as well as providing standard errors that are robust to heteroskedasticity. Using clustering in a fixed effects model thereby gives a consistent estimation of a panel with cluster-variance while controlling for endogeneity.

Taken together, our results are puzzling. The negative effect of harmonization, particularly that of the banking directives, on industrial growth is difficult to explain given the initial objectives of the FSAP. Our findings demonstrate that the effect of the FSAP directives on growth is not as beneficial as the policy makers had initially expected. These findings could be due to different factors.

Integration versus uniformity

A first possibility is that not all these directives served to reduce costs through market integration. Harmonization is a broad term that could capture different realities. On the one hand, harmonization could refer to integration, thus lowering the cost of cross-border financial activity. On the other hand, harmonization could simply mean uniformity, without necessarily implying the lowering of costs. We therefore take the directives in Table 2.3[16] and classify them into three groups: those that imply integration, those that imply uniformity, and those that fall under the others category. The first category of directives, those that promote integration, is made up of directives which aim to improve the efficiency of payments, eliminate tax distortions, simplify regulation, create a single passport for securities, increase competition, remove barriers and restrictions, expand investment options and reduce the cost of capital. The main goal of this category of directives is to *lower* the costs of cross-border financial activity. The second category of directives, those that promote uniformity, seeks to improve risk management, harmonize cross-border supervision, encourage innovation, improve prudential regulation and rules, and increase consumer confidence and protection. Although these directives may also contribute to removing some restrictions, they are more aimed towards making rules and regulation more uniform, and often involve *increasing* the costs of cross-border financial activity.[17] The third category consists of all other directives which are not easily classifiable under the two former categories.[18]

Columns (1) – (3) of Table 2.6 report the same specification as Table 2.5, but employ a different harmonization index for each of the three categories of directives. Using the same indexing strategy as discussed earlier, the findings demonstrate that the uniformity index has a negative impact on industrial growth. Both integration and others indices are not found to be significant. This result shows that not all harmonization is the same: harmonization that effectively improves market integration ceases to have a significant negative impact, whereas harmonization which is mainly aimed at making countries "similar" continues to have a negative effect on growth. Including the effect of the interaction term reinforces this dichotomy, as it is found to be positively significant for those directives that promote integration, whereas it is insignificant for those directives that promote uniformity for the industries with higher dependence on external funds. Taken together, this suggests that harmonization thought of as integration has an overall positive effect[19], whereas harmonization thought of as uniformity has an overall negative effect on industrial growth. More broadly speaking, some directives may lower the cost of cross-border financial

[16] The Supplementary Appendix provides a more in depth guide for the FSAP directives and the different categories that they fall under. Please refer to the Appendix and the Supplementary Appendix for further information on 27 directives of the FSAP.

[17] Increasing costs refer to mostly cost of compliance and capital costs that are born on investors and issuers across countries.

[18] Note that the classification of the directives under each category can be regarded as being subjective. However, the main goal through this analysis is to examine whether the effect of financial harmonization on industrial growth is amplified when directives that aim to implement similar objectives are grouped together under an index.

[19] The positive effect of integration directives holds for industries that have a higher dependence (at the maximum level) on external finance, in other words, at the maximum level of external finance dependence, harmonization that implies integration has a positive impact on industrial growth.

activity, whereas others may increase it. Grouping all directives together under the common wording of "harmonization" may thus be misleading.

EU-15 versus the rest

A second possibility for the negative effect of harmonization in our benchmark specification is that the new member states of the EU exhibit different behavior from the original EU-15 members, and that this difference is not adequately picked up by the country-fixed effects. One of the biggest criticisms for the FSAP measures is that they have been implemented without further consideration of the structural basis of integration in securities, retail and financial markets across the EU.[20] This suggests that the FSAP measures may not be as effective in markets that are not completely integrated. Truly integrated markets should in fact benefit from financial harmonization through the reduction in costs of investment, enhancements in consumer protection, improvements in allocation of investment resources, and innovation. However, without a well-integrated financial market, financial harmonization policies could only provide small benefits to EU member countries.

We thereby believe that EU-15 countries which have been a part of the union for a longer period of time may have a different response to the implementation of the FSAP policies in comparison to newer members of the EU. Similarly being a part of a monetary union might have an additional influence on growth. Another issue is that the FSAP was largely negotiated when the new member states were not yet a part of the EU, raising the possibility that their specific needs were not sufficiently taken into account. If so, we would expect the effect of financial harmonization to have a positive impact on the growth rate of EU-15 countries, unlike the negative effect that is depicted for the entire sample.

In order to further analyze this issue, we divide our sample set into subgroups. In column (4) of Table 2.6 we report the results for the EU-15 countries. Column (4) shows that the harmonization index is in fact positively significant. This implies that for EU-15 countries financial harmonization has a positive impact on industrial growth. In column (5) we examine the case with Euro countries. In the Euro countries the effects of financial harmonization should be enhanced due to the existence of a monetary union. Consistent with this view, in column (5), we find that the harmonization index is not only positive but also very significant. Lastly column (6) shows that for the case of non-EU 15 countries the effect of financial harmonization is negative. The interaction terms are positive but not significant in any of the regressions reported in columns (4) to (6). Overall, this suggests that the Euro and the EU-15 countries benefitted the most, whereas the new member states seem to have suffered a negative effect from the FSAP.[21]

Relative timing (speed) of adoption

A third possibility for our initial finding of a negative effect of harmonization on growth might be related to the relative timing of adoption. For example, if Czech Republic adopts a directive, and no other country adopts the same directive, then we cannot talk about harmonization. In that case Czech Republic would simply bear the cost of adopting the directive, without attaining any benefits from it. Not controlling for this would introduce a bias. Given that there exist significant differences across EU member countries in the timing of adoption, this is a potential issue. Recall that the FSAP directives need to be transposed into

[20] Please refer to Alexander (2002).

[21] We have also checked for the influence of the Euro's effect on industrial growth rates by including a euro dummy in our estimations. The results reported in the Supplementary Appendix show that the euro dummy is not significant in our analysis.

national law before they become effective. This has to be done within a specified period of time, but some countries do so faster than others.
With this in mind, we consider whether there is a disadvantage from adopting these directives earlier. In order to check for this possibility, we construct a new variable which we call the harmonization difference:

$$Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$$

where $Harmonization_{i,t}$ is the harmonization index of country *i* in year t, and $Harmonizationave_t$ is the average index of harmonization across countries in year t. The harmonization difference is a measure that depicts how many FSAP directives are adopted by each country relative to the average rate of adoption for all countries per year. Using this variable we can analyze the impact of being an early versus a late adopter on industrial growth. Column (7) of Table 2.6 reports the results when this new variable is included in our full sample. As expected, our findings show that there is a negative effect of being an early adopter. The interpretation of this result is as follows: the FSAP directives aim to unify financial markets across the EU. However, this could only be mutually beneficial for countries when they all implement these directives.

More importantly, once we control for the harmonization the difference, the harmonization index is now positive and significant. The positive effect of harmonization is carried through both the harmonization index and the interaction term which imply that the growing need of external finance, together with the ongoing process of transposition of the directives brings an enhancement to industrial growth. With the inclusion of the harmonization difference measure, the harmonization index acts like an average harmonization indicator that generates the impact of harmonization across countries at the average level. Figure 1 shows details of the harmonization process for 25 countries in our sample. The harmonization process in EU-15 countries proceeded gradually, whereas for new EU member countries it happened more suddenly in big jumps. As a result, the difference between the harmonization index and the average harmonization per year is largest for the non-EU 15 countries. In order to further investigate this, we split our sample into EU-15 countries, Euro countries and non-EU 15 countries.

Table 2.7 presents our findings for three different samples. Column (1) reports the results for EU-15 countries. The harmonization index is found to be positively significant implying that the adoption of the FSAP directives by EU-15 countries augments growth. The coefficient on the harmonization difference measure is negative but not significant indicating that being an early adopter does not have a clear negative effect on industrial growth. Similarly the harmonization index is found to be positive and significant and the harmonization difference measure negative but insignificant for Euro countries in column (2). Interaction terms in both columns demonstrate that for EU-15 and Euro countries the effects of harmonization do not appear stronger for industries that the depend more on external finance, the coefficients being statistically insignificant.[22] Column (3) depicts the results for non-EU 15 countries. Harmonization index is no longer significant whereas the harmonization difference is negatively significant suggesting that among the non-EU 15 countries it is clearly more beneficial to be a late adopter than an early one.

Taken together, our results imply that, once we control for the relative timing of adoption, harmonization has a positive effect on growth, though that effect is not always statistically significant. The sign of the

[22] At the mean level of external finance dependence across industries, the total effect of harmonization for EU-15 and Euro countries is found to be positive. The total effect for the non-EU 15 countries at the mean level of external finance is negative, implying that the total impact of harmonization on industrial growth is not beneficial.

harmonization index changes conditional on the inclusion of the harmonization difference measure that accounts for the relative timing of adoption. As for being an early adopter, our results show that this is true for all cases, but only statistically significant for the non-EU 15 countries, and for the entire sample.

Exclusion of some countries

A fourth possibility for our initial finding might be the result of the bias introduced by the inclusion of some countries in our sample. Figure 1 demonstrates that there are two countries which require closer analysis. Latvia and Poland seem to have adopted some FSAP directives much earlier than other non-EU 15 countries. In fact, the data from the European Commission suggest that they adopted some of these measures much before becoming part of the EU. This could potentially be the result of the amendment of some existing directives that had already been transposed into domestic law prior to the implementation of the Financial Services Action Plan. In order to verify whether these two countries create any biases for the effects of harmonization on industrial growth, we exclude them from our sample and reanalyze our benchmark model. The results in columns (4) and (5) of Table 2.7 are similar to those reported in Tables 2.5 and 2.6. Harmonization index is still found to be negatively influential on growth rates when we exclude Latvia and Poland from our sample. Once again, the inclusion of the harmonization difference measure causes the harmonization index to become positively significant, indicating that harmonization is beneficial for growth, but that being an early adopter is not.

We also examine the sensitivity of our results when we exclude four countries that might bring potential biases due to their large share of foreign banks and liabilities. In order to observe whether the effects of external finance dependence of industries and the enhancement of harmonization policies on industrial growth are triggered by the inclusion of countries with greater banking shares, we exclude Cyprus, Malta, Luxembourg and the U.K. from our estimations. Column (6) depicts insignificant effects for the harmonization index and the interaction term. In column (7) the harmonization index is found to be positively significant and the harmonization difference measure negatively significant which correspond to the results found in column (7) of Table 2.6, implying that the exclusion of countries with a larger share of foreign banks and liabilities does not alter our main findings.

Competing explanations

So far we have conveyed four reasons for why we observe a negative relationship between financial harmonization following the FSAP policies and industrial growth rates across European countries. A negative relationship could occur as a result of harmonization capturing different realities such as integration and uniformity, as a result of the FSAP policies aiming to create benefits for those that have been a part of the EU for a longer period of time and the likely impact of some countries with larger banking shares which may potentially bias the results, or due to the fact that there is a difference in terms of timing of adoption of the FSAP directives which has to be considered in estimations regarding this link. We have shown that EU-15 and Euro countries have a positive coefficient for financial harmonization. Similarly the exclusion of countries that have larger banking shares does not alter our initial findings for the negative result. The two remaining reasons for the initial negative effect of harmonization on growth thereby are the nature of harmonization and its timing. In order to study which one of these competing explanations is dominant, we test our results using indices for integration, uniformity and other directives taking into account the relative timing of adoption of the FSAP directives in our regressions. The results reported in Table 2.8 show that with the inclusion of the relative timing of adoption, financial

harmonization becomes positively significant. The results reveal that the negative effect occurs as a result of not accounting for the speed of adoption.[23]

The findings from Table 2.6, 2.7 and 2.8 with the inclusion of the harmonization difference depict that being an early adopter could lead to lower growth perspectives for all 25 countries, and for different subgroups of countries. In order to correctly examine the impact of early versus late adoption we need to include further controls into the model.

Adding controls

Adding further controls may be important to avoid omitted variable bias. Given that we already have country, industry and time fixed effects, we focus on controls that are country and time variant. Firstly, in order to account for the structural features of the banking systems in European countries, we follow the methodology proposed by Kalemli – Ozcan, Papaioannou, and Peydro (2010 b) and use control variables for bank's overhead costs, bank's profitability and banking concentration from Beck, Demirguc-Kunt, and Levine's Financial Development and Structure Database (2000). Given that there exist concerns regarding the implementation of the FSAP and its dependence on local conditions of the banking systems, we believe that the inclusion of these variables can provide a better picture for the link between harmonization policies and industrial growth. The results, not reported here[24], do not have any systematic effects on our model. Secondly, in order to account for differences in legal, institutional and governmental structures, as well as stock market and overall financial development, we include country and time-variant measures in our model.

Table 2.9 reports the results for the entire sample, EU-15 countries, and non-EU 15 countries when control variables for financial and stock market development and legal and institutional quality are used. The short period availability of financial development indicators and legal variables reduces our sample size to the 1996 – 2007 period. Columns (1), (3) and (5) show that, when not controlling for the harmonization difference measure, the harmonization index is found to be negatively significant for all countries and for non-EU 15 countries and positive but insignificant for EU-15 countries. The inclusion of the harmonization difference measure in columns (2), (4) and (6) leads to a change in the sign of harmonization indices.[25] The coefficients of the interaction terms imply that the simultaneous effect of harmonization and external finance dependence has a negative impact on industrial growth. Overall the results depict that harmonization is beneficial for all countries conditional on the relative timing of adoption, and with the inclusion of further controls that account for outside effects. However, being an early adopter of the FSAP directives proves to have a disadvantageous effect on growth. This is now true for all groups of countries, though the effect is statistically insignificant for the EU-15 subgroup.

Legal origins

Lastly, we consider whether the results of our benchmark model alter with the inclusion of legal origins of countries. Legal origins refer to the differences across countries in terms of their legal systems which are structured according to families of law. Depending on the historical background and development of legal families, on the characteristics of the functioning of legal matters, and on distinctive institutions each

[23] Further robustness checks using integration, uniformity and other directives with control variables strengthen the argument that the relative timing of adoption is the dominant factor behind the initial negative effect of financial harmonization on industrial growth.

[24] Please see Supplementary Appendix Table 2.2.3 for the results.

[25] The change in the sign occurs for all countries, and for non-EU 15 countries.

country has a differing legal tradition. As La Porta et al. present in their series of articles (1997, 1998, and 2008) the most popular legal traditions are the common law and the civil law from which several sub-traditions such as the French, German, socialist and Scandinavian legal origins arise.[26] Although for our particular study, there is not much difference between the French, German and British laws that implement the EU legislation proposed under the FSAP, the way these provisions will be carried out into the domestic law, the manner that the directives will be monitored and enforced may show vast differences across member countries. This remains to be a factor too strong to forgo. This implies that together with governmental and institutional factors, differences in legal origins across countries may highly influence the link between financial harmonization and growth. Our analysis with the addition of legal origins, although not reported here, finds the effect of financial harmonization index to be negative but insignificant on industrial growth for all countries.[27] Once again, the signs of harmonization indices across all countries, EU-15 countries, and non-EU 15 countries change when the harmonization difference measure is included in the model. Although the legal origin dummies for the U.K., France, Germany, Socialist regimes, and Scandinavian countries appear to be significant in some regressions, the results obtained are similar to the ones found in the benchmark case, and to those found in Table 2.8.

2.4.2 Dynamic panel data model

We include a dynamic panel data model in order to examine the partial adjustment property of harmonization policies, to analyze possible long-run effects of harmonization and to determine whether a dynamic setting would add to the relationship between harmonization and growth. The results of the dynamic panel data model should not be thought to overcast the findings of our benchmark model. Firstly, even if governments of countries in the EU anticipate higher growth rates following harmonization, it is unlikely that the officials in each industry could determine the timing of adoption in their own country as well as in other countries.[28] Secondly, and more importantly, if countries harmonize because of expected growth, early harmonization should be beneficial. In fact, we find the opposite which we report in the following section.

Table 2.10 depicts the results of 4 different dynamic Arellano-Bond GMM type panel models. Due to the use of control variables, the estimation period is reduced to 1996 – 2007. The lagged dependent variable in column (1) has a negative and significant coefficient. The harmonization index in the dynamic panel data model is found to have a positively significant effect when the harmonization difference measure and other control variables are included in the model. Harmonization difference measure is found to be negative and significant. Columns (2) and (3) report the results for EU-15 countries and columns (4) and (5) report the results for non-EU 15 countries. In column (2), the lagged dependent variable is negative and significant, implying that previous growth perspectives lead to a slowdown in current growth. The variables of interest on the other hand are found to have insignificant coefficients.[29] Column (4) shows that for non-EU 15 countries none of the variables of interest is significant. In order to correct for this

[26] Please refer to La Porta et al. (2008). Legal origins dummies are obtained from the original La Porta et al. (1998) study and they are created by assigning a value of 1 for countries that have a specified legal tradition such as civil or common law, and 0 otherwise.

[27] Please see the Supplementary Appendix, Table 2.2.4 for the results using controls and legal origins.

[28] Both Rajan and Zingales (1998) and Klenow (1998) argue that there is low correlation across industrial growth rates. This low correlation in industrial growth stands as an additional reason for why causality (or the endogeneity of harmonization) is not a problem in our analysis.

[29] Column (3) uses government effectiveness and deposit money bank assets to central bank assets ratio as additional instruments. The inclusion of these variables as instruments does not bring significant changes to our estimations.

problem in column (5) we report results for non-EU 15 countries with controls using additional instruments.[30] Harmonization index is then found to be positive and significant. The harmonization difference is also negatively significant implying that being an early adopter for non-EU 15 countries is not beneficial. In all estimations the Arellano-Bond tests of serial correlation show that we do not have any problems with the error terms in our regressions, whereas the Sargan tests do not report overidentification problems regarding the instruments to be used in the estimation of the model in all columns.[31]

We have experimented with different control variables that are common to growth regressions. The inclusion of secondary school enrollment rate to account for differences in human capital across countries, government expenditures, or health expenditures does not alter the results reported by the dynamic panel data model.

To analyze the long-run effects of harmonization policies and the interaction term we divide each coefficient by 1 – γ, where γ represents the coefficient of the lagged dependent variable in our model. The results show that the harmonization index has a positive coefficient for growth when we consider its long-run impact.[32] This suggests that, given the shorter sample, and the control variables selected, the effect of harmonization will be positive in the long-run. The interaction term has a negative effect on growth, suggesting that in the long-run, the benefits of harmonizing in a full sample of European economies may not work through the simultaneous effect of external finance dependence of industries. Overall, the results of interest confirm our findings from the benchmark model in that harmonization has a positive effect on growth once we take into account the harmonization difference measure and other controls.

2.5 Concluding Remarks

Starting with the adoption of the Euro in 1999, the European Union has taken initiatives in building a more integrated and harmonized financial market among its member states. With the establishment of the Financial Services Action Plan, the European Commission has taken a further step to integrate the European countries through legislative and regulatory terms in banking, insurance and securities markets.

[30] The instruments used in the dynamic panel data model estimations fall under two categories; GMM and IV type instruments. GMM type instruments consist of endogenous variables such as the lagged dependent or explanatory variables. IV type instruments on the other hand are explanatory variables that are exogenous as well as additional set of instruments which are not part of the original equation. All columns use the 4th lag of the logarithm of gross value added in levels as GMM type instruments; whereas columns (1), (2) and (3) use political stability measure from the Worldwide Governance Indicators dataset, lag of the harmonization index, lag of the interaction term, and time dummies as IV type instruments. Column (4) in addition to these IV type instruments uses the ratio of deposit money bank assets to the sum of deposit money bank and central bank assets, stock market turnover ratio, and government effectiveness as instruments. For a further explanation of the variables please refer to the Supplementary Appendix. We make use of political stability as an instrument due to its exogeneity with industrial growth. Our estimations including this variable as a control does not depict significant results, which then strengthens our argument for using it as an instrument.

[31] The lags of instruments used for the dynamic panel data model specification are of vital importance. Due to the static nature of the problem, using a dynamic panel data model with an incorrect specification can bias our findings. In order to account for this we experiment with various lag structures and instruments.

[32] The EU-15 countries have a negative coefficient for harmonization that is insignificant in column (3) and a positive but insignificant coefficient in column (4). We believe that this alteration can be a result of the instruments selected in the analysis. Given that the coefficients are insignificant in either case we restrain from concluding that the long-run impact of harmonization in EU-15 countries is negative or positive.

Since the goal of the FSAP is to enhance growth in Europe, this paper has assessed whether this has been the case or not. When using a standard specification --- regressing growth on harmonization controlling for country, industry and time fixed effects --- we find that harmonization did not have the expected effect. Instead, growth seems to have been negatively impacted by the introduction of the FSAP. However, this standard specification, used in other papers on financial deregulation and harmonization, fails to control for an important factor: the relative timing of adoption. Indeed, we would only expect harmonization to be beneficial if all countries adopt the directives. That is, adopting when others do not, would not imply true harmonization, putting early adopters at a disadvantage. Once we control for the relative timing of adoption, we find that harmonization has the expected positive effect on growth, whereas being an early adopter (mostly) has a negative effect. These results are shown to be robust to including different controls, splitting up the sample into different subgroups of countries, and extending the model to a dynamic specification.

This paper suggests several promising areas of future research. First, as time passes, and more data become available for a longer time period, a more in-depth dynamic analysis of the impact of the FSAP could be carried out. Of particular interest would be to see whether the different behavior of the non-EU 15 countries[33] that we uncovered gets mitigated over time. Second, our paper has gone beyond the simple cross-country analysis common to many studies by including industrial data. A next natural step would be to use firm-level data. Doing so would allow us to better measure the interaction between the impact of the FSAP and the dependence on external finance at the firm-level. Third, our paper shows that the relative timing of adoption is key to understand the impact of harmonization policies on growth. This suggests that controlling for this relative timing should be useful for other studies that have analyzed the impact of deregulation or harmonization.

[33] Another topic of interest is to uncover the channels that affect the EU-15 countries and explain their different behavior in some of our estimations.

2.6 References

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2.7 Appendix

Table 2.1: Currency units

Country	Currency	Comments
Austria	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (13.7603 ATS to EURO)
Belgium	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (40.3399 BEF to EURO)
Cyprus	Cypriot Pound	The entire series is obtained from the EU KLEMS dataset which has the data in Cypriot Pounds throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Cypriot Pound to Euros (0.57884 CYP to EURO) for the period prior to 1999
Czech Republic	Czech Koruna	The entire series is obtained from the EU KLEMS dataset which has the data in Czech Korunas throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Czech Koruna to Euros (36.884 CZK to EURO) for the period prior to 1999
Denmark	Danish Krone	The entire series is obtained from the EU KLEMS dataset which has the data in Danish Krones throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Danish Krone to Euros (7.4355 DKK to EURO) for the period prior to 1999
Estonia	Estonian Kroon	The entire series is obtained from the EU KLEMS dataset which has the data in Estonian Kroons throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Estonian Kroon to Euros (15.6466 EEK to EURO) for the period prior to 1999
Finland	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (5.94573 FIM to EURO)
France	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (6.55957 FRF to EURO)

Germany	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (1.95583 DEM to EURO)
Greece	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (340.750 GRD to EURO)
Hungary	Hungarian Forint	The entire series is obtained from the EU KLEMS dataset which has the data in Hungarian Forints throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Hungarian Forint to Euros (252.77 HUF to EURO) for the period prior to 1999
Ireland	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (0.787564 IEP to EURO)
Italy	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (1936.27 ITL to EURO)
Latvia	Latvian Lats	The entire series is obtained from the EU KLEMS dataset which has the data in Latvian Lats throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Latvian Lats to Euros (0.6256 LVL to EURO) for the period prior to 1999
Lithuania	Lithuanian Lita	The entire series is obtained from the EU KLEMS dataset which has the data in Lithuanian Litas throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Lithuanian Lita to Euros (4.2641 LTL to EURO) for the period prior to 1999
Luxembourg	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (40.3399 LUF to EURO)
Malta	Maltese Lira	The entire series is obtained from the EU KLEMS dataset which has the data in Maltese Liras throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Maltese Lira to Euros (0.4258 MTL to EURO) for the period prior to 1999

Netherlands	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (2.20371 NLG to EURO)
Poland	Polish Zloty	The entire series is obtained from the EU KLEMS dataset which has the data in Polish Zloties throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Polish Zloty to Euros (4.2274 PLN to EURO) for the period prior to 1999
Portugal	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (200.482 PTE to EURO)
Slovakia	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (44.1230 SKK to EURO)
Slovenia	Slovenian Tolar	The entire series is obtained from the EU KLEMS dataset which has the data in Slovenian Tolars throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Slovenian Tolar to Euros (4.2274 SIT to EURO) for the period prior to 1999
Spain	Euro	The entire series is obtained from the EU KLEMS dataset which has the data in Euros from 1999 onwards. For the data in years before 1999 EU KLEMS has used the 1999 official fixed Euro conversion rate (166.386 ESP to EURO)
Sweden	Swedish Krona	The entire series is obtained from the EU KLEMS dataset which has the data in Swedish Kronas throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of Swedish Krona to Euros (8.8075 SEK to EURO) for the period prior to 1999
UK	British Pound Sterling	The entire series is obtained from the EU KLEMS dataset which has the data in British Pounds throughout the period. The data is converted to Euros using the exchange rates from Eurostat for the period after 1999, and using the 1999 official fixed exchange rate of British Pound to Euros (0.65874 GBP to EURO) for the period prior to 1999

Sources: EU KLEMS dataset http://www.euklems.net/ and Timmer, Marcel, Ton van Moergastel, Edwin Stuivenwold, Gerard Ypma, Mary O'Mahony, and Mari Kangasniemi. (2007). "EU KLEMS Growth and Productivity Accounts, Version 1", *EU KLEMS*, pp. 56. The currency unit refers to the units obtained from the EU KLEMS dataset. As expressed previously any currency that is not converted into Euros in the original EU KLEMS dataset is converted into Euros using 1999 fixed exchange rates for the periods prior to 1999, and official bilateral exchange rates as reported in Eurostat for the periods after 1999.

Table 2.2: Timing of the FSAP Directives for the EU Member Countries

Directives	AT	BE	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV
1998/26/EC	1999	1999	Not Yet	Not Yet	2000	2004	1999	2001	1999	2000	Not Yet	1999	2001	Not Yet
2000/46/EC	2002	2003	2004	2003	2005	2006	2003	2003	2002	2003	2004	2002	2002	2004
2000/64/EC	2003	2004	2002	2004	2004	2001	2004	2006	2002	2004	2002	Not Yet	Not Yet	2004
2001/17/EC	2003	2004	2004	2004	2006	2005	2004	2005	2003	Not Yet	2004	2003	2003	2004
2001/24/EC	2003	2004	2004	2005	2004	2005	2004	2004	2004	2006	2004	2004	2004	2004
2001/65/EC	*2004*	2005	2003	2004	2002	2004	2004	2004	2004	2006	2004	2004	2005	1993
2001/86/EC	2004	2004	2004	2004	2004	2005	2004	2005	2004	2006	2004	2006	2005	2005
2001/97/EC	2003	2004	2003	2004	2005	2004	2003	2004	2002	2005	2003	2003	2004	2004
2001/107/EC	2003	2004	2004	2004	2004	2004	2004	2003	2004	2004	2003	2003	2003	2005
2001/108/EC	2003	2004	2004	2004	2005	2004	2004	2003	2004	2004	2003	2003	2003	2004
2002/13/EC	2003	2004	2004	2004	2004	2005	2004	2004	2004	2005	2004	2005	2004	1998
2002/47/EC	2003	2005	2004	2005	2004	2004	2004	2005	2004	2004	2004	2004	2004	2005
2002/65/EC	2004	2006	2004	2004	2005	2004	2005	2005	2004	2005	2005	2004	2005	2004
2002/87/EC	2005	2005	2005	2005	2004	2005	2004	2004	2005	2006	2004	2005	2005	2005
2002/83/EC	2003	2004	2004	2004	2004	2005	2004	2004	2004	2005	2004	2005	2004	1998
2002/92/EC	2004	2005	2004	2005	2005	2005	2005	2005	Not Yet	2005	2005	2005	2006	2005
2003/6/EC	2005	2005	2005	2006	2005	2005	2005	2005	2004	2005	2005	2005	2005	2005
2003/41/EC	2005	2006	2006	2006	2005	2004	2006	2006	2005	2005	2005	2005	Not Yet	2005
2003/48/EC	2004	2005	2005	2004	2004	2004	2004	2003	2005	2005	2003	2003	2005	2005
2003/51/EC	2005	2006	2005	2004	2002	2005	2004	2004	2004	2006	2005	2005	Not Yet	1993
2003/71/EC	2005	2006	2005	2006	2005	2005	2005	2005	2005	2005	2005	2005	Not Yet	2005
2004/25/EC	2006	2007	2007	2006	2005	2007	2006	2006	2006	2006	Not Yet	2006	2007	2006
2004/109/EC	2007	2007	Not Yet	2006	2007	2007	2007	2007	2007	2007	Not Yet	2007	2007	2007
2004/39/EC	2007	2008	Not Yet	2006	2007	2007	2007	2007	2007	2007	Not Yet	2007	2007	Not Yet
2005/56/EC	2007	2008	2007	Not Yet	2007	Not Yet	2007	2008	2007	Not Yet	Not Yet	2008	2008	Not Yet
2006/48/EC	2007	2007	Not Yet	Not Yet	2007	2007	2007	2007	2006	2007	Not Yet	2007	2007	Not Yet
2006/49/EC	2007	2007	Not Yet	2006	2007	2007	2007	2007	2006	2007	Not Yet	2007	2007	Not Yet

Directives	LT	LU	MT	NL	PL	PT	SK	SI	ES	SE	UK
1998/26/EC	Not Yet	2001	2002	1999	Not Yet	2000	2006	2004	1999	2000	1999
2000/46/EC	2005	2002	2002	2002	2003	2002	2004	2006	2002	2002	2002
2000/64/EC	2004	2001	2002	2003	2004	2000	2006	2004	2002	2000	2003
2001/17/EC	2004	2004	2004	2004	2004	2003	2005	2004	2003	2006	2003
2001/24/EC	2005	2004	2004	2005	2004	2006	2005	2004	2005	2006	2004
2001/65/EC	*2004*	*2006*	*2001*	*2005*	*1995*	*2004*	*2005*	*2004*	*2004*	*2004*	*2004*
2001/86/EC	2005	2006	2004	2005	2005	2005	2004	2006	2006	2004	2004
2001/97/EC	2004	2004	2003	2001	2001	2004	2006	2002	2003	2005	2004
2001/107/EC	2003	2003	2004	2005	2004	2004	2004	2004	2004	2004	2004
2001/108/EC	2003	2003	2004	2005	2004	2004	2004	2004	2004	2004	2004
2002/13/EC	2004	2004	2004	2003	2004	2003	2004	2004	2004	2004	2004
2002/47/EC	2004	2005	2005	2004	2004	2004	2005	2003	2002	2005	2005
2002/65/EC	2004	Not Yet	2005	2006	2000	Not Yet	2005	Not Yet	Not Yet	2004	2004
2002/87/EC	2004	2006	2005	2007	2005	Not Yet	2006	2006	2005	2006	2004
2002/83/EC	2004	2004	2004	2003	2004	2003	2004	2004	2004	2004	2005
2002/92/EC	2004	2005	2006	2005	2004	2006	2005	2004	2006	2005	2005
2003/6/EC	2004	2006	2005	2005	2005	2006	2006	2004	2005	2005	2005
2003/41/EC	2006	2005	2004	2006	1999	2006	2005	2003	2005	2006	2005
2003/48/EC	2005	2005	2004	2004	2005	2005	2005	2006	2004	2005	2005
2003/51/EC	2003	2006	2002	2005	1995	2005	2005	Not Yet	2005	2006	2005
2003/71/EC	2005	2005	2005	2005	2005	2005	2005	2006	2005	2005	2005
2004/25/EC	2007	2006	2006	2007	Not Yet	2006	2007	2006	2007	2006	2006
2004/109/EC	2007	2007	2007	Not Yet	Not Yet	2007	Not Yet	2007	2007	2007	2007
2004/39/EC	Not Yet	2008	2007	2007	Not Yet	2007	2007	2007	2007	2007	2007
2005/56/EC	Not Yet	2007	2007	2008	Not Yet	Not Yet	Not Yet	Not Yet	Not Yet	2008	2007
2006/48/EC	Not Yet	2007	2007	2007	Not Yet	2007	Not Yet	2007	2008	2007	2007
2006/49/EC	Not Yet	2007	2007	2007	Not Yet	2007	2007	2007	2008	2007	2007

Sources: Kalemli – Ozcan, Sebnem, Elias Papaioannou, and Jose Luis Peydro. (2010 b). "What Lies Beneath the Euro's Effect of Financial Integration? Currency Risk, Legal Harmonization, or Trade?", *Journal of International Economics*, 81 (1): 75 – 88, European Commission. 2010. "Transposition of Financial Services Action Plan" http://ec.europa.eu/internal_market/finances/actionplan/transposition/database/austria_en.htm, and Europa, Access to European Union Law National Execution Measures, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:72006L0049:EN:NOT#FIELD_MT

Table 2.3: Directives of the Financial Services Action Plan (FSAP)

Directives	***Directive Names***	***Deadline***	***Category***
1998/26/EC	Settlement Finality Directive	1/06/2005	Securities
2000/46/EC	Directive on the taking up, pursuit and prudential supervision of the businesses of electronic money institutions (E-Money Directive)	27/04/2002	Banking
2000/64/EC	Directive amending the insurance directives and the ISD to permit information exchange with third countries	17/11/2002	Insurance
2001/17/EC	Directive on the reorganization and winding-up of insurance undertakings	20/04/2003	Insurance
2001/24/EC	Directive on the reorganization and winding-up of banks	5/05/2004	Banking
2001/65/EC	Directive amending the 4th and the 7th Company Law Directives to allow fair value accounting	9/10/2004	Securities
2001/86/EC	Directive supplementing the Statute for a European Company with regard to the involvement of employees	10/10/2004	Securities
2001/97/EC	Directive amending the money laundering directive (2nd Money Laundering Directive)	15/06/2003	Banking
2001/107/EC	1st Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	13/08/2003	Securities
2001/108/EC	2nd Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	13/08/2003	Securities
2002/13/EC	Directive amending the solvency margin requirements in the insurance directives	20/09/2003	Insurance
2002/47/EC	Directive on financial collateral arrangements	17/12/2003	Securities
2002/65/EC	Directive on the Distance of marketing of Financial Services	1/01/2004	Insurance
2002/87/EC	Directive on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate (Financial Conglomerates Directive)	11/08/2004	Banking
2002/83/EC	Directive amending the solvency margin requirements in the insurance directives	20/09/2003	Insurance
2002/92/EC	Directive on insurance mediation	15/01/2005	Insurance
2003/6/EC	Directive on insider dealing and market manipulation	12/10/2004	Securities
2003/41/EC	Directive on the prudential supervision of pension funds	23/09/2005	Insurance

2003/48/EC	Directive on the taxation of savings income in the form of interest payments (Savings Tax Directive)	1/01/2004	Banking
2003/51/EC	Directive modernizing the accounting provisions of the 4th and the 7th Company Law Directives	1/01/2005	Securities
2003/71/EC	Directive on prospectuses	1/07/2005	Securities
2004/25/EC	Directive on Take Over Bids	20/5/2006	Securities
2004/109/EC	Transparency directive	20/01/2007	Securities
2004/39/EC	Directive on Markets in Financial Instruments (update of ISD) - MiFID	20/01/2007	Securities
2005/56/EC	10th Company Law Directive on cross-border mergers of limited liability companies	15/12/2007	Securities
2006/48/EC	Directive on the relating to the taking up and pursuit of the business of credit institutions	31/12/2006	Banking
2006/49/EC	Directive on the capital adequacy of investment firms and credit institutions	31/12/2006	Banking

Sources: Kalemli – Ozcan, Sebnem, Elias Papaioannou, and Jose Luis Peydro. (2010 b). "What Lies Beneath the Euro's Effect of Financial Integration? Currency Risk, Legal Harmonization, or Trade?", *Journal of International Economics*, 81 (1): 75 – 88 and Supplementary Appendix Table A, http://www.dartmouth.edu/~elias/jie_SAT-A.pdf, European Commission. 2010. Transposition of Financial Services Action Plan http://ec.europa.eu/internal_market/finances/actionplan/transposition/database/austria_en.htm

Table 2.4: Summary Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
GVAGRO	59114	0.0337	0.1462	-5.4337	3.5476
External finance dependence	28500	0.0744	0.2001	-0.2993	0.5416
Harmonization	101650	0.4297	0.9486	0	3.3322
Harmonization interaction	28500	0.0319	0.2201	-0.9974	1.8047
Harmonization*	101650	0.4240	0.9322	0	3.0910
Harmonization**	101650	0.2104	0.5468	0	2.0794
Harmonization* interaction	28500	0.0316	0.2164	-0.9252	1.6741
Harmonization** interaction	28500	0.0156	0.1241	-0.6224	1.1262
Harmonization difference	101650	4.77e-09	0.2185	-1.5349	1.5011
Bank assets	8340	0.9677	0.0662	0.4620	0.9999
Turnover ratio	8970	0.6125	0.5011	0.0014	2.6758
Government effectiveness	9000	1.2835	0.5696	0.0782	2.3379
Regulatory quality	9000	1.2636	0.3747	0.4393	2.0578
Rule of Law	9000	1.1981	0.5232	0.1039	2.0142

Note: *GVAGRO* is equal to the gross value added growth. *External finance dependence* is the external finance dependence measure of Rajan and Zingales (1998). *Harmonization*, *Harmonization** and *Harmonization*** are harmonization indices constructed using the directives of the Financial Services Action Plan. *Harmonization interaction*, *Harmonization* interaction*, *and Harmonization** interaction* are interaction terms that are equal to the products of harmonization indices and the external finance dependence measure of Rajan and Zingales. *Harmonization difference* is the difference between a country's harmonization index and average harmonization for that particular year. *Bank assets ratio* is the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets, *Turnover ratio* is stock market turnover ratio, *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators.

Table 2.5: Gross Value Added Growth for European Industries with Fixed Effects

	Dependent Variables		
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**
Log of Gross Value Added (Lagged)	-0.0129***	-0.0129***	-0.0128***
	(-5.029)	(-5.027)	(-4.976)
	[0.00256]	[0.00256]	[0.00258]
Harmonization	-0.0105		
	(-1.323)		
	[0.00795]		
Harmonization interaction	0.0144*		
$(Harmonization \times exf)$	(1.804)		
	[0.00799]		
Harmonization*		-0.0110	
(21 directives)		(-1.371)	
		[0.00805]	
Harmonization* interaction		0.0145*	
$(Harmonization^{*} \times exf)$		(1.784)	
		[0.00812]	
Harmonization**			-0.0250***
(7 directives)			(-2.628)
			[0.00950]
Harmonization** interaction			0.0225*
$(Harmonization^{**} \times exf)$			(1.677)
			[0.0134]
Observations	17,380	17,380	17,380
R-squared	0.098	0.098	0.098
Country fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Time fixed effects	Yes	Yes	Yes

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $log(gva_{i,s,t}) - log(gva_{i,s,t-1})$. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. Harmonizationi,t^{*} = ln (1 + $lexro_{i,t}$) where $lexro_{i,t}$ represents the sum of all 21 directives excluding the 6 directives implemented after 2003. Harmonizationi,t^{**} = ln (1 + $banklex_{i,t}$) where $banklex_{i,t}$ represents the sum of all 7 banking directives. *exf* is the external finance dependence of U.S. firms in 1970s calculated by Rajan and Zingales (1998). The above estimations include the lagged logarithm of gross value added in levels. The regressions are estimated over 25 countries, 30 industries and 37 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1971 – 2007. The above estimations include country, industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

Table 2.6: New Specifications for Gross Value Added Growth for European Industries with Fixed Effects

	Dependent Variables						
		All countries		**EU-15**	**Euro**	**Non-EU 15**	**All countries**
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**	**(4) GVAGRO**	**(5) GVAGRO**	**(6) GVAGRO**	**(7) GVAGRO**
Log of Gross Value Added (Lagged)	-0.0128*** (-5.004) [0.00257]	-0.0128*** (-4.996) [0.00257]	-0.0128*** (-4.990) [0.00256]	-0.00894*** (-3.355) [0.00266]	-0.0103*** (-3.763) [0.00274]	-0.0274*** (-3.736) [0.00733]	-0.0129*** (-5.029) [0.00256]
Harmonization				0.0176** (2.375) [0.00739]	0.0234*** (2.971) [0.00788]	-0.0233* (-1.748) [0.0133]	0.0280*** (6.133) [0.00456]
Harmonization interaction $(Harmonization \times exf)$				0.00421 (0.596) [0.00707]	0.00648 (0.811) [0.00798]	0.0134 (0.591) [0.0227]	0.0144* (1.804) [0.00799]
Harmonizationdif							-0.0385*** (-4.168) [0.00923]
Harmonization (Integration directives)	-0.00457 (-0.511) [0.00893]						
Harmonization interaction $(Harmonization \times exf)$ (Integration directives)	0.0221* (1.834) [0.0121]						
Harmonization (Uniformity directives)		-0.0153* (-1.848) [0.00826]					
Harmonization interaction		0.0175					

$(Harmonization \times exf)$		(1.615)					
(Uniformity directives)		[0.0108]					
Harmonization			-0.00119				
(Other directives)			(-0.151)				
			[0.00783]				
Harmonization interaction			0.0207				
$(Harmonization \times exf)$			(1.472)				
(Other directives)			[0.0141]				
Observations	17,380	17,380	17,380	14,048	11,049	3,332	17,380
R-squared	0.098	0.098	0.098	0.111	0.123	0.116	0.098
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $\log(gva_{i,s,t}) - \log(gva_{i,s,t-1})$. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. *exf* is the external finance dependence of U.S. firms in 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. The first three columns report the results for an industrial composition of financial harmonization directives. The FSAP directives are grouped under three categories; integration, uniformity and others. The construction of the indices follows the original calculations discussed in Section 2. The above estimations include the lagged logarithm of gross value added in levels. The regressions in the first three columns are estimated over 25 countries, 30 industries, and 37 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the U.K. Column (4) is estimated over 15 countries, 30 industries and 37 years. The EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the U.K. Column (5) is estimated over 12 euro countries and 37 years. The 12 euro countries are: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain. Column (6) is estimated over 10 countries, 30 industries and 37 years. The 10 non-EU 15 countries included are: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. Column (7) includes all countries in the sample and is estimated over 25 countries, 30 industries and 37 years. The estimation period in our regressions is 1971 – 2007. The above estimations include country, industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

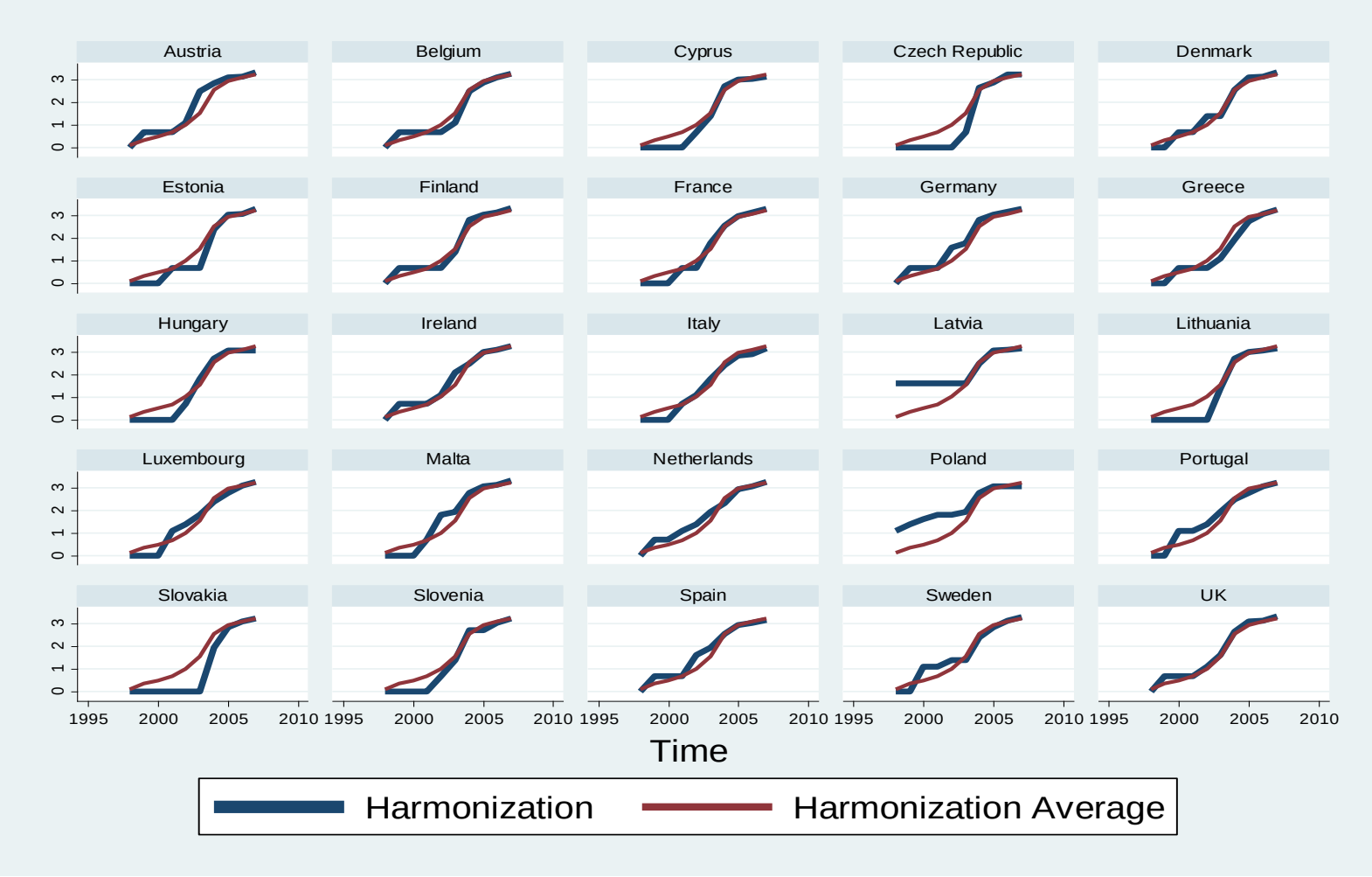

Figure 2.1: Evolution of Financial Harmonization Policies across European Countries

The figure above is generated in Stata and depicts the graphs for the harmonization index that is constructed using 27 directives of the Financial Services Action Plan and the harmonization average indicator which is the mean value of the harmonization index of 25 European countries per each year in our sample size.

Table 2.7: Robustness Checks for Gross Value Added Growth for European Industries with Fixed Effects

	Dependent Variables						
	EU-15	**Euro**	**Non-EU 15**	**No Latvia or Poland**		**No Cyprus, Luxembourg, Malta, or U.K.**	
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**	**(4) GVAGRO**	**(5) GVAGRO**	**(6) GVAGRO**	**(7) GVAGRO**
Log of Gross Value Added (Lagged)	-0.00894***	-0.0103***	-0.0274***	-0.0124***	-0.0124***	-0.0110***	-0.0110***
	(-3.355)	(-3.763)	(-3.736)	(-4.748)	(-4.748)	(-3.990)	(-3.990)
	[0.00266]	[0.00274]	[0.00733]	[0.00260]	[0.00260]	[0.00276]	[0.00276]
Harmonization	0.0217***	0.0245***	0.00979	-0.0143*	0.0285***	-0.00856	0.0255***
	(5.093)	(5.192)	(1.101)	(-1.671)	(6.159)	(-1.020)	(5.383)
	[0.00427]	[0.00473]	[0.00889]	[0.00854]	[0.00463]	[0.00840]	[0.00473]
Harmonization interaction	0.00421	0.00648	0.0134	0.0125	0.0125	0.0140	0.0140
$(Harmonization \times exf)$	(0.596)	(0.811)	(0.591)	(1.541)	(1.541)	(1.618)	(1.618)
	[0.00707]	[0.00798]	[0.0227]	[0.00811]	[0.00811]	[0.00865]	[0.00865]
Harmonizationdif	-0.00420	-0.00115	-0.0330**		-0.0428***		-0.0340***
	(-0.484)	(-0.123)	(-2.298)		(-4.391)		(-3.584)
	[0.00868]	[0.00931]	[0.0144]		[0.00974]		[0.00950]
Observations	14,048	11,049	3,332	16,745	16,745	15,182	15,182
R-squared	0.111	0.123	0.116	0.098	0.098	0.101	0.101
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $log(gva_{i,s,t}) - log(gva_{i,s,t-1})$. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country,

and a value of 0 otherwise. *exf* is the external finance dependence of U.S. firms in 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. The above estimations include the lagged logarithm of gross value added in levels. Column (1) is estimated over 15 countries, 30 industries and 37 years. The EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the U.K. Column (2) is estimated over 12 euro countries, 30 industries and 37 years. The 12 euro countries are: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain. Column (3) is estimated over 10 countries, 30 industries and 37 years. The 10 non-EU 15 countries included are: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. Columns (4) and (5) are estimated over 23 countries, 30 industriess and 37 years, excluding Latvia and Poland. Finally columns (6) and (7) are estimated over 21 countries, 30 industries and 37 years excluding Cyprus, Luxembourg, Malta and the U.K. The estimation period in our regressions is 1971 – 2007. The above estimations include country, industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

Table 2.8: Robustness check for competing explanations for European Industries with Fixed Effects

	Dependent Variables		
	(1)	(2)	(3)
VARIABLES	**GVAGRO**	**GVAGRO**	**GVAGRO**
Log of Gross value added (Lagged)	-0.0128***	-0.0128***	-0.0128***
	(-5.004)	(-4.996)	(-4.990)
	[0.00257	[0.00257]	[0.00256]
Harmonization	0.0368***		
(Integration directives)	(6.029)		
	[0.00611]		
Harmonization interaction	0.0221*		
$(Harmonization \times exf)$	(1.834)		
(Integration directives)	[0.0121]		
Harmonizationdif	-0.0414***		
(Integration directives)	(-3.804)		
	[0.0109]		
Harmonization		0.0409***	
(Uniformity Directives)		(6.196)	
		[0.00660]	
Harmonization interaction		0.0175	
$(Harmonization \times exf)$		(1.615)	
(Uniformity directives)		[0.0108]	
Harmonizationdif		-0.0562***	
(Uniformity directives)		(-5.148)	
		[0.0109]	
Harmonization			0.0488***
(Other directives)			(6.569)

			[0.00743]
Harmonization interaction			0.0207
$(Harmonization \times exf)$			(1.472)
(Other directives)			[0.0141]
Harmonizationdif			-0.0500***
(Other directives)			(-4.399)
			[0.0114]
Observations	17,380	17,380	17,380
R-squared	0.098	0.098	0.098

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $\log(gva_{i,s,t}) - \log(gva_{i,s,t-1})$. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. *exf* is the external finance dependence of U.S. firms in 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. The first three columns report the results for an industrial composition of financial harmonization directives. The FSAP directives are grouped under three categories; integration, uniformity and others. The construction of the indices follows the original calculations discussed in Section 2. The above estimations include the lagged logarithm of gross value added in levels. The regressions in the first three columns are estimated over 25 countries, 30 industries, and 37 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the U.K. The estimation period in our regressions is 1971 – 2007. The above estimations include country, industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

Table 2.9: Gross Value Added Growth for European Industries with Fixed Effects and with Further Controls

	Dependent Variables					
	All countries		**EU-15 countries**		**Non-EU 15 countries**	
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**	**(4) GVAGRO**	**(5) GVAGRO**	**(6) GVAGRO**
Log of Gross Value Added (Lagged)	-0.0103***	-0.0103***	0.000459	0.000459	-0.0262***	-0.0262***
	(-2.623)	(-2.623)	(0.113)	(0.113)	(-3.120)	(-3.120)
	[0.00393]	[0.00393]	[0.00407]	[0.00407]	[0.00838]	[0.00838]
Harmonization	-0.0160*	0.0832***	0.0106	0.0512	-0.0310**	0.0606
	(-1.780)	(2.804)	(1.236)	(0.933)	(-2.290)	(1.475)
	[0.00897]	[0.0297]	[0.00855]	[0.0548]	[0.0136]	[0.0411]
Harmonization interaction $(Harmonization \times exf)$	-0.00591	-0.00591	-0.0164*	-0.0164*	0.0168	0.0168
	(-0.576)	(-0.576)	(-1.654)	(-1.654)	(0.779)	(0.779)
	[0.0103]	[0.0103]	[0.00991]	[0.00991]	[0.0216]	[0.0216]
Harmonizationdif		-0.0992***		-0.0406		-0.0916**
		(-3.268)		(-0.734)		(-2.212)
		[0.0304]		[0.0553]		[0.0414]
Bank assets ratio	-0.205**	-0.205**	-0.0678	-0.0678	-0.249**	-0.249**
	(-2.482)	(-2.482)	(-0.427)	(-0.427)	(-2.551)	(-2.551)
	[0.0826]	[0.0826]	[0.159]	[0.159]	[0.0975]	[0.0975]
Turnover ratio	-0.0116*	-0.0116*	0.00751	0.00751	-0.0147	-0.0147
	(-1.670)	(-1.670)	(1.178)	(1.178)	(-1.227)	(-1.227)
	[0.00696]	[0.00696]	[0.00638]	[0.00638]	[0.0120]	[0.0120]
Government effectiveness	0.0376***	0.0376***	0.0219*	0.0219*	0.0458	0.0458
	(3.151)	(3.151)	(1.841)	(1.841)	(1.204)	(1.204)
	[0.0119]	[0.0119]	[0.0119]	[0.0119]	[0.0380]	[0.0380]
Regulatory quality	0.0855***	0.0855***	0.0504*	0.0504*	0.106*	0.106*
	(3.147)	(3.147)	(1.961)	(1.961)	(1.837)	(1.837)
	[0.0272]	[0.0272]	[0.0257]	[0.0257]	[0.0575]	[0.0575]

Rule of law	-0.0682***	-0.0682***	-0.0795***	-0.0795***	-0.0775*	-0.0775*
	(-2.929)	(-2.929)	(-2.849)	(-2.849)	(-1.935)	(-1.935)
	[0.0233]	[0.0233]	[0.0279]	[0.0279]	[0.0401]	[0.0401]
Observations	7,012	7,012	4,134	4,134	2,878	2,878
R-squared	0.097	0.097	0.098	0.098	0.119	0.119

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $\log(gva_{i,s,t}) - \log(gva_{i,s,t-1})$. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. exf is the external finance dependence of U.S. firms in the 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Bank assets ratio* is the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets, *Turnover ratio* is stock market turnover ratio, *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators. The above estimations include the lagged logarithm of gross value added in levels. The regressions in columns (1) – (2) are estimated over 25 countries, 30 industries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the U.K. Columns (3) – (4) are estimated over 15 countries, 30 industries and 12 years. The EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the U.K. Columns (5) – (6) are estimated over 10 countries, 30 industries and 12 years. The 10 non-EU 15 countries included are: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. The estimation period in our regressions is 1996 – 2007. The above estimations include country, industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

Table 2.10: Arellano – Bond Dynamic Panel Model for Gross Value Added Growth for European Industries with Further Controls

	Dependent Variables				
	All countries	**EU-15 countries**		**Non-EU 15 countries**	
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**	**(4) GVAGRO**	**(5) GVAGRO**
Gross Value Added Growth (Lagged)	-0.936***	-0.765*	-0.785*	-0.457	-0.329
	(-3.299)	(-1.648)	(-1.676)	(-1.379)	(-1.007)
	[0.284]	[0.464]	[0.469]	[0.332]	[0.327]
Harmonization	0.207**	-0.0144	0.000137	0.0205	0.0448*
	(2.101)	(-0.245)	(0.00799)	(0.345)	(1.714)
	[0.0987]	[0.0588]	[0.0172]	[0.0596]	[0.0262]
Harmonization interaction $(Harmonization \times exf)$	-0.131	-0.0671	-0.0509	-0.214	-0.245
	(-1.174)	(-0.687)	(-0.646)	(-1.338)	(-1.571)
	[0.112]	[0.0976]	[0.0787]	[0.160]	[0.156]
Harmonizationdif	-0.350**	-0.00893	-0.0189	0.0339	-0.296***
	(-2.382)	(-0.114)	(-0.281)	(0.129)	(-2.830)
	[0.147]	[0.0781]	[0.0673]	[0.262]	[0.105]
Bank assets	-11.99**	-0.990	-1.354	0.189	-0.956
	(-2.221)	(-0.245)	(-1.225)	(0.0913)	(-1.414)
	[5.399]	[4.046]	[1.105]	[2.065]	[0.677]
Turnover ratio	0.00177	-0.0134	-0.0275	0.0599	-0.0637
	(0.0318)	(-0.238)	(-0.426)	(0.376)	(-0.591)
	[0.0557]	[0.0565]	[0.0645]	[0.159]	[0.108]
Government Effectiveness	0.236***	-0.0115	-0.00219	0.924	0.169
	(2.719)	(-0.157)	(-0.0671)	(1.559)	(1.444)
	[0.0866]	[0.0733]	[0.0326]	[0.593]	[0.117]
Regulatory quality	-0.290	0.592	0.535**	-0.0382	-0.226
	(-0.681)	(1.578)	(2.497)	(-0.0545)	(-0.444)

	[0.426]	[0.375]	[0.214]	[0.701]	[0.508]
Rule of law	0.890	-0.205	-0.179	-0.636	-0.329
	(1.577)	(-0.428)	(-0.640)	(-1.289)	(-0.704)
	[0.564]	[0.480]	[0.280]	[0.494]	[0.468]
Observations	6,134	3,544	3,380	2,590	2,561
Number of groups	708	424	403	284	284
AB test for AR(1) (p value)	0.73	-0.21	-0.14	-1.04	-0.91
	(0.464)	(0.837)	(0.885)	(0.300)	(0.365)
AB test for AR(2) (p value)	-0.72	-1.66	-1.60	-1.15	-1.13
	(0.470)	(0.097)	(0.109)	(0.251)	(0.259)
Sargan test	0.203	0.177	0.505	0.060	0.027
Hansen test	0.367	0.401	0.622	0.115	0.192

Note: Robust t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the Gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $\log(gva_{i,s,t}) - \log(gva_{i,s,t-1})$. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. exf_s is the external finance dependence of U.S. firms in 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Bank assets ratio* is the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets, *Turnover ratio* is stock market turnover ratio, *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators. Regression in column (1) is estimated over 25 countries, 30 industries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the U.K. Column (2) is estimated over 15 countries, 30 industries and 12 years. The EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the U.K. Columns (3) and (4) are estimated over 10 countries, 30 industries and 12 years. The 10 non-EU 15 countries included are: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. The estimation period in our regressions is 1996 – 2007. All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model. All columns use the 4^{th} lag of the logarithm of gross value added as GMM type instruments. Columns (1), (2) and (4) use political stability measure from World Governance Indicators dataset, first lag of the harmonization index, first lag of the interaction term and the time dummies as IV type instruments. Column (3) in addition to these IV type instruments employs the ratio of deposit money bank assets to the sum of deposit money bank and central bank assets, and government effectiveness as instruments, and column (5) introduces the ratio of deposit money bank assets to the sum of deposit money bank and central bank assets, and government effectiveness and stock market turnover ratio as instruments. The results reported here use the onestep estimator. (The estimations use the Stata xtabond2 command).

2.8 Supplementary Appendix

DATA APPENDIX

Industrial growth: We use gross value added in constant Euros for 25 European Union countries. For the time period before the introduction of the Euro, the EU KLEMS uses the 1999 official fixed Euro exchange rates of the Euro countries to convert local currencies into Euros. Consistent with this, for the non-Euro countries for the time period before the introduction of the Euro, we take the 1999 Euro exchange rates with the local currencies to convert them into Euros. The gross value added growth rate is calculated as: $GVAGRO_{i,s,t} = \log\left(GVA_{i,s,t}\right) - \log(GVA_{i,s,t-1})$ where $GVA_{i,s,t}$ is gross value added in country *i*, industry *s*, and time *t*. *Source: EU KLEMS Database*

External finance dependence: External finance dependence is calculated for a firm as the desired investment that cannot be financed through internal cash flows. Rajan and Zingales (1998) calculate a firm's external finance dependence as: $exffirm_{s,t} = \frac{capexp_{s,t} - cfo_{s,t}}{capexp_{s,t}}$ where $exffirm_{s,t}$ is the external finance dependence measure, $capexp_{s,t}$ is capital expenditures, and $cfo_{s,t}$ is cash flow from operations of a firm in industry *s*. In order to obtain the firm's overall dependence on external finance in 1970s they sum the external finance measure over 10 years (1970 until 1980) and divide it by the sum of capital expenditures over the same period. To obtain a measure of finance dependence at the sectoral level, exf_s they use the industry median. *Source: Rajan and Zingales (1998)*

Financial harmonization: We construct harmonization indices for EU countries using adoption dates of the different directives in different countries from the EU Commission's Financial Services Action Plan. In particular, for each of the 27 directives listed under the FSAP we define a dummy variable that takes on a value of one on and after the date that the country under examination has transposed the directive into national law, and a value of zero otherwise. We sum all 27 directives to construct our next variable, *lex*$_{i,t}$ (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a, b): $lex_{i,t} = \sum_{k=1}^{27} Directives_{i,t}^{k}$. We construct our financial harmonization index by: $harmon_{i,t} = \ln(1 + lex_{i,t})$ where *k* represents all 27 directive dummies, *i* represents the countries, and *t* represents the years in the sample. *Source: Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a, b, and author's calculations.*

Interaction term: The interaction term which will help identify the simultaneous effect of harmonization and external finance dependence of industries on growth is constructed as follows: $interaction_{i,s,t} = (exf_s \times harmon_{i,t})$ where *i* represents the countries, *s* represents the industries (sectors), *t* represents the years in the sample, exf_s is the industry variant external finance dependence measure of Rajan and Zingales, and $harmon_{i,t}$ is the harmonization index constructed using the directives of the *FSAP. Source: Author's calculations.*

Control Variables:
Deposit money bank assets to central bank assets ratio (in percentages): It is measured by the ratio of deposit money bank claims on domestic non-financial real sector to the sum of deposit money bank and Central Bank claims on domestic non-financial real sector. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2012)*

Stock market turnover ratio (in percentages): It is used as the efficiency indicator of stock markets (Demirguc-Kunt and Levine, 2001). Stock market turnover ratio measures "the activity or liquidity of a stock market relative to its size." (Demirguc-Kunt and Levine, 2001, 32). It is equal to the ratio of the value of total shares traded to average real market capitalization. Note that small and active stock markets will have a larger turnover ratio based on the above definition whereas large and less liquid stock markets will have a lower turnover ratio. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2012)*

Number of publicly listed companies per 10K population: This variable reflects the share of companies divided by the total population rate. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2012)*
Legal and institutional variable: They are used to measure economic institutions and the overall quality of legal systems. The three variables used in our analysis are constructed from subjective and perceptions-based data that reflect views of a range of respondents, agencies and organizations. These indicators, *government effectiveness*, *regulatory quality, rule of law* are measured through a range from -2.5 to 2.5 where higher values correspond to better governance outcomes. We also use *voice accountability* as an instrument in dynamic panel model estimations. *Source: World Bank's Worldwide Governance Indicators*

Government effectiveness: It captures the perceptions from surveys of the quality of public services, civil service, the degree of dependence from political pressures, the quality of policy formulation and implementation and the reliability of the governments in terms of commitment to achieve such policies. *Source: Worldwide Governance Indicators*, http://info.worldbank.org/governance/wgi/pdf/ge.pdf

Regulatory quality: It captures the perceptions of the ability of the government to implement sound policies and regulations that promote private sector development. *Source: Worldwide Governance Indicators*, http://info.worldbank.org/governance/wgi/pdf/rq.pdf

Rule of law: It captures perceptions of the extent of agents' confidence in the acceptance and abidance of the rules of a society, with a particular focus on the quality of contract enforcement, property rights, the police, the courts and the likelihood of crime and violence. *Source: Worldwide Governance Indicators*, http://info.worldbank.org/governance/wgi/pdf/rl.pdf

Voice accountability: It captures perceptions of the extent to which a country's citizens are able to participate in the selection of their government, as well as freedom of expression and association and free media. *Source: Worldwide Governance Indicators*, http://info.worldbank.org/governance/wgi/pdf/va.pdf

Table 2.2.1: Industries used in the dataset and their correspondences in Rajan & Zingales (1998)

Industries in our sample	Matching industries from Rajan & Zingales (1998)
TOTAL INDUSTRIES	
AGRICULTURE, HUNTING, FORESTRY AND FISHING	
AGRICULTURE, HUNTING AND FORESTRY	
Agriculture	
Forestry	
FISHING	
MINING AND QUARRYING	
MINING AND QUARRYING OF ENERGY PRODUCING MATERIALS	
Mining of coal and lignite; extraction of peat	
Extraction of crude petroleum and natural gas and services	Petroleum refineries (353)
Mining of uranium and thorium ores	
MINING AND QUARRYING EXCEPT ENERGY PRODUCING MATERIALS	
Mining of metal ores	
Other mining and quarrying	
TOTAL MANUFACTURING	
FOOD , BEVERAGES AND TOBACCO	Food products (311) + Beverages (313) + Tobacco (314)
Food and beverages	Beverages (313) + Food products (311)
Tobacco	Tobacco (314)
TEXTILES, TEXTILE , LEATHER AND FOOTWEAR	Textile (321) + Leather (323) + Footwear (324) + Spinning (3211) + Apparel (322)
Textiles and textile	Spinning (3211)
Textiles	Textile (321)
Wearing Apparel, Dressing And Dying Of Fur	Apparel (322)
Leather, leather and footwear	Leather (323) + Footwear (324)
WOOD AND OF WOOD AND CORK	Wood products (331)

PULP, PAPER, PAPER , PRINTING AND PUBLISHING	Pulp, paper (3411) + Paper and products (341)+ Printing & publishing (342)
Pulp, paper and paper	Pulp, paper (3411)
Printing, publishing and reproduction	Printing & publishing (342)
Publishing	
Printing and reproduction	
CHEMICAL, RUBBER, PLASTICS AND FUEL	Petroleum and coal products (354) + Other chemicals (352) + Drugs (3522) + Basic exclude fert (3511) + Plastic products (356) + Rubber products (355)
Coke, refined petroleum and nuclear fuel	Petroleum and coal products (354)
Chemicals and chemical products	Other chemicals (352)
Pharmaceuticals	Drugs (3522)
Chemicals excluding pharmaceuticals	Basic exclude fert (3511)
Rubber and plastics	Plastic products (356) + Rubber products (355)
OTHER NON-METALLIC MINERAL	Glass (362) + Non metal products (369) + Pottery (361)
BASIC METALS AND FABRICATED METAL	Metal products (381)
Basic metals	Non-ferrous metal (372) + Iron and steel (371)
Fabricated metal	
MACHINERY, NEC	Machinery (382)
ELECTRICAL AND OPTICAL EQUIPMENT	
Office, accounting and computing machinery	Office & computing (3825)
Electrical engineering	
Electrical machinery and apparatus, nec	Electric machinery (383)
Insulated wire	
Other electrical machinery and apparatus nec	
Radio, television and communication equipment	Radio (3832)
Electronic valves and tubes	
Telecommunication equipment	
Radio and television receivers	
Medical, precision and optical instruments	
Scientific instruments	Professional goods (385)
Other instruments	

TRANSPORT EQUIPMENT	
Motor vehicles, trailers and semi-trailers	Motor Vehicle (3843)
Other transport equipment	Transportation equipment (384)
Building and repairing of ships and boats	Ship (3841)
Aircraft and spacecraft	
Railroad equipment and transport equipment nec	
MANUFACTURING NEC; RECYCLING	
Manufacturing nec	
Recycling	
ELECTRICITY, GAS AND WATER SUPPLY	
ELECTRICITY AND GAS	
Electricity supply	
Gas supply	
WATER SUPPLY	
CONSTRUCTION	
WHOLESALE AND RETAIL TRADE	
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	
Wholesale trade and commission trade, except of motor vehicles and motorcycles	
Retail trade, except of motor vehicles and motorcycles; repair of household goods	
HOTELS AND RESTAURANTS	
TRANSPORT AND STORAGE AND COMMUNICATION	
TRANSPORT AND STORAGE	
Inland transport	
Water transport	
Air transport	
Supporting and auxiliary transport activities; activities of travel agencies	

POST AND TELECOMMUNICATIONS
FINANCE, INSURANCE, REAL ESTATE AND BUSINESS SERVICES
FINANCIAL INTERMEDIATION
Financial intermediation, except insurance and pension funding
Insurance and pension funding, except compulsory social security
Activities related to financial intermediation
REAL ESTATE, RENTING AND BUSINESS ACTIVITIES
Real estate activities
Renting of m&eq and other business activities
Renting of machinery and equipment
Computer and related activities
Research and development
Other business activities
Legal, technical and advertising
Other business activities, nec
COMMUNITY SOCIAL AND PERSONAL SERVICES
PUBLIC ADMIN AND DEFENCE; COMPULSORY SOCIAL SECURITY
EDUCATION
HEALTH AND SOCIAL WORK
OTHER COMMUNITY, SOCIAL AND PERSONAL SERVICES
Sewage and refuse disposal, sanitation and similar activities
Activities of membership organizations nec
Recreational, cultural and sporting activities
Media activities
Other recreational activities
Other service activities

PRIVATE HOUSEHOLDS WITH EMPLOYED PERSONS
EXTRA-TERRITORIAL ORGANIZATIONS AND BODIES

Sources: EU KLEMS dataset http://www.euklems.net/ and Rajan, Raghuram G., and Luigi Zingales. (1998). "Financial Dependence and Growth", *American Economic Review*, 88 (3): 559 - 586

Table 2.2.2: Description of the Directives of the Financial Services Action Plan

Directive	Directive No.	Deadline
Settlement Finality Directive	1998/26/EC	01/06/2005
This directive is implemented to reduce systemic risk in payment and securities settlement systems, particularly aiming to reduce the risk of insolvency of a member country. Main objectives of this directive include protection of transfer orders, greater competition between settlement providers and the removal of barriers to post-trading.		
Directive on the taking up, pursuit and prudential supervision of the businesses of electronic money institutions (E-Money Directive)	2000/46/EC	27/04/2002
The E-Money directive defines electronic money and sets conditions for capital and authorization requirements of electronic money institutions. Main objectives of this directive are to implement appropriate prudential rules and encourage innovation and confidence so as to boost the number of passports used in the banking system as well as to increase the use of e-money.		
Directive amending the insurance directives and the ISD to permit information exchange with third countries	2000/64/EC	17/11/2002
This directive allows for the exchange of information between the third country authorities and authorities of the Member States. It allows for the conclusion of cooperation agreements by the Member States providing an environment for exchange of information with the authorities of third countries.		
Directive on the reorganization and winding-up of insurance undertakings	2001/17/EC	20/04/2003
This directive aims to ensure that mutual recognition is applied to the winding-up and reorganization of insurance undertakings within the EU. The main objectives of this directive include reducing regulatory requirements regarding bankruptcy and increasing consumer protection in order to create more cross-border business through branches and more direct cross-border insurance.		
Directive on the reorganization and winding-up of banks	2001/24/EC	05/05/2004
This directive ensures that the banks across the Member States can be wound up and reorganized as a single entity. The main objectives of this directive include reducing regulatory requirements regarding bankruptcy and increasing consumer protection.		
Directive amending the 4th and the 7th Company Law Directives to allow fair value accounting	2001/65/EC	09/10/2004

This directive highlights the existing EU Accounting Directives for companies, banks and other financial institutions and concentrates on the valuation of assets. It aims to achieve a single set of financial statements for listed companies across Member States. The directive is intended to establish greater transparency, increased investment and information disclosure.		
Directive supplementing the Statute for a European Company with regard to the involvement of employees	2001/86/EC	10/10/2004
This directive provides provisions for the creation of a Statute for a European company particularly for employee involvement.		
Directive amending the money laundering directive (2nd Money Laundering Directive)	2001/97/EC	15/06/2003
This directive highlights the importance of the scope of predicate offences and the reporting of suspicious activity in banking. It is established in order to cut funding for organized crime and terrorism. Its main objectives include increasing market confidence, reducing money laundering, and decreasing the risk of banking crises.		
1st Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	2001/107/EC	13/08/2003
This directive aims to regulate management companies and provide simplified prospectuses for investment purposes. It promotes the consolidation of EU funds and generation of economies of scale. By providing greater flexibility for fund managers, this directive hopes to increase cross border trade in UCITS.		
2nd Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	2001/108/EC	13/08/2003
This directive has the objectives of harmonizing information to investors, expanding investment options, providing a larger number of passports to ease cross border trade, and increasing the use of eligible assets so as to allow for quicker diffusion of products.		
Directive amending the solvency margin requirements in the insurance directives	2002/13/EC	20/09/2003
This directive was implemented in order to improve prudential regulation of insurance companies. It addresses the reduction in the amount of regulatory capital an insurance undertaking is obliged to hold against unforeseen conditions, as well as aiming to simplify regulation and increase consumer protection.		
Directive on financial collateral arrangements	2002/47/EC	17/12/2003

This directive creates greater enforceability for collateral backing transactions across the Member States. It aims to reduce systemic risk in securities settlement and the cost of capital, provide a harmonized legal treatment of financial collateral, and increase cross-border trading.		
Directive on the Distance of marketing of Financial Services	2002/65/EC	01/01/2004
This directive helps in protecting retail consumers of financial products sold at a distance. It aims to remove barriers to cross-border provision and expects to achieve higher cross-border consolidation in insurance through M&A activity. This directive provides higher protection for retail consumers and helps increase the levels of competition between suppliers throughout Member States.		
Directive on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate (Financial Conglomerates Directive)	2002/87/EC	11/08/2004
This directive provides a settlement on how the lead supervisor of a financial conglomerate should be decided and how supervisory arrangements should be fulfilled. It aims to ensure soundness of financial institutions through better prudential regulation such as risk reflective capital levels, improved risk management, and harmonization of cross-border and cross-sector supervision.		
Directive amending the solvency margin requirements in the insurance directives (Solvency 1 directive for life insurance)	2002/83/EC	20/09/2003
This directive aims to increase consumer protection and lower the costs for the insurance sector. It helps merge national markets so as to achieve a highly integrated single market in terms of life insurance.		
Directive on insurance mediation	2002/92/EC	15/01/2005
This directive is proposed to remove barriers to insurance intermediaries, enhance consumer protection and encourage retail insurance across borders of Member States. It brings together the issues regarding authorization, capitalization and regulation of intermediaries and brokers who sell insurance products under a single framework. It aims to provide higher quality advice and products in the insurance sector as well as to increase cross-border consolidation in insurance.		
Directive on insider dealing and market manipulation (Market Abuse Directive)	2003/6/EC	12/10/2004

This directive is aimed to terminate market abuse and insider trading. It is established to improve market transparency and confidence, and increase investment. Through this directive the markets are assumed to be more effectively protected against abuse due to the new changes that relate to mandatory suspicious transaction reporting.		
Directive on the prudential supervision of pension funds	2003/41/EC	23/09/2005
This directive brings new regulation to the operation of employment-related pension schemes across Member States. It aims to create an internal market that will allow for occupational retirement provision organized in a European scale.		
Directive on the taxation of savings income in the form of interest payments (Savings Tax Directive)	2003/48/EC	01/01/2004
This directive is implemented to prevent cross-border tax evasion by individuals within the EU. Through this directive, the Member States will be able to exchange information on interest income paid to non-residents or to tax that particular income.		
Directive modernizing the accounting provisions of the 4th and the 7th Company Law Directives	2003/51/EC	01/01/2005
This directive hopes to improve transparency in standards of corporate reporting. It aims to enhance investor confidence and to increase competition in the investment market and information quality.		
Directive on prospectuses	2003/71/EC	01/07/2005
This directive is established to increase transparency and investor confidence in the securities markets across Member States. It proposes passporting of prospectuses that are to be published for securities trade to the public across the EU borders so as to achieve a more competitive market for issuers and investors. This directive provides a single passport for issuers of equity and debt securities easing the transactions of securities across the EU borders. It aims to harmonize information, promote a more competitive EU market in securities, and reduce the cost of capital.		
Directive on Take Over Bids	2004/25/EC	20/05/2006
This directive is implemented to promote free market in corporate control and enhance competition in securities markets. It aims to implement a minimum framework to the national approval of takeovers in applicable law, protection of shareholders and disclosure. Its main objective includes insurance of an efficient market for M&A activity through which merger related costs and increase cross-border activity in M&A will be reduced.		
Transparency directive	2004/109/EC	20/01/2007
This directive aims to increase the quality of information available to investors in the securities market and promote a more competitive investment market. It proposes an obligation on issuers of securities to meet continuing disclosure requirements after the issue.		
Directive on markets in Financial Instruments	2004/39/EC	20/01/2007

(update of ISD) – MiFID		
This directive aims to create an integrated single European market of financial instruments. It promotes banks to internalize trading across Europe and compete with exchanges. Through greater internalization across banks, this directive hopes to increase competition, reduce the cost of capital and enhance fair competition between exchanges and banks. This directive is expected to create appropriate investor protection, single passport for securities trade, remove barriers to entry for exchanges and increase competition between trading venues.		
10th Company Law Directive on cross-border mergers of limited liability companies	2005/56/EC	15/12/2007
This directive is created to allow companies to conduct cross-border mergers. It ensures efficient market for M&A activity. It aims to decrease merger related costs and increase cross-border M&A activity. It provides a more secure and transparent environment for cross-border restructuring.		
Directive on the relating to the taking up and pursuit of the business of credit institutions	2006/48/EC	31/12/2006
This directive is established to coordinate credit institutions in order to protect savings and to create equal conditions of competition between institutions.		
Directive on the capital adequacy of investment firms and credit institutions	2006/49/EC	31/12/2006
This directive establishes the capital adequacy requirements for investment firms and credit institutions, setting the rules for their prudential supervision. Its main objectives include harmonization of capital adequacy of investment firms and credit institutions, enhancement of effective risk management for banks, and the creation of a safer environment that would decrease possibility for banking crises.		

Source: The definitions for the directives are collected from the following: Kalemli – Ozcan, Sebnem, Elias Papaioannou, and Jose Luis Peydro. (2010 b). "What Lies Beneath the Euro's Effect of Financial Integration? Currency Risk, Legal Harmonization, or Trade?", *Journal of International Economics*, 81 (1): 75 – 88 and Supplementary Appendix Table A, http://www.dartmouth.edu/~elias/jie_SAT-A.pdf, European Commission. 2010. Transposition of Financial Services Action Plan http://ec.europa.eu/internal_market/finances/actionplan/transposition/database/austria_en.htm, Boyfield, Keith, Hugo Robinson, and Lorraine Mullally. (2006). "Selling the City Short? A Review of the EU's Financial Services Action Plan", *Open Europe*, 1 – 119, (http://www.openeurope.org.uk/Content/Documents/PDFs/fsap.pdf), Malcolm, Kyla, Mark Tilden, and Tim Wilsdon. (2009). "Evaluation of the economic impacts of the Financial Services Action Plan", *European Commission Internal Market and Services Final Report*, 1 – 243

Table 2.2.3: Gross Value Added Growth for European Industries with fixed effects, with further controls for the banking sector

	Dependent Variables			
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**	**(4) GVAGRO**
Log of Gross value added (Lagged)	-0.0110***	-0.0110***	-0.0109***	-0.0109***
	(-3.080)	(-3.080)	(-2.774)	(-2.774)
	[0.00356]	[0.00356]	[0.00394]	[0.00394]
Harmonization	-0.0142	0.0463***	-0.0176**	0.101***
	(-1.645)	(6.005)	(-1.984)	(3.297)
	[0.00866]	[0.00771]	[0.00885]	[0.0307]
Harmonization interaction $(Harmonization \times exf)$	-0.00423	-0.00423	-0.00631	-0.00631
	(-0.405)	(-0.405)	(-0.616)	(-0.616)
	[0.0104]	[0.0104]	[0.0102]	[0.0102]
Harmonizationdif		-0.0605***		-0.119***
		(-4.917)		(-3.804)
		0.0123		[0.0312]
Overhead costs	-0.418**	-0.418**	-0.251	-0.251
	(-2.157)	(-2.157)	(-1.251)	(-1.251)
	[0.194]	[0.194]	[0.200]	[0.200]
Bank's profitability	0.192	0.192	0.561*	0.561*
	(0.630)	(0.630)	(1.713)	(1.713)
	[0.304]	[0.304]	[0.327]	[0.327]
Banking concentration	-0.0146	-0.0146	-0.0492**	-0.0492**
	(-0.662)	(-0.662)	(-2.076)	(-2.076)
	[0.0220]	[0.0220]	[0.0237]	[0.0237]
Bank assets			-0.218***	-0.218***
			(-2.629)	(-2.629)
			[0.0829]	[0.0829]

Turnover ratio			-0.0127*	-0.0127*
			(-1.731)	(-1.731)
			[0.00736]	[0.00736]
Gov. Effectiveness			0.0419***	0.0419***
			(3.492)	(3.492)
			[0.0120]	[0.0120]
Regulatory quality			0.0825***	0.0825***
			(2.934)	(2.934)
			[0.0281]	[0.0281]
Rule of law			-0.0748***	-0.0748***
			(-3.120)	(-3.120)
			[0.0240]	[0.0240]
Observations	7,506	7,506	6,952	6,952
R-squared	0.091	0.091	0.098	0.098

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $loggva_{i,s,t} - loggva_{i,s,t-1}$. Harmonization interaction$_{i,s,t}$ = Harmonizationi,t * exf$_s$, Harmonizationi,t = ln (1 + lex$_{i,t}$) where lex$_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. exf$_s$ is the external finance dependence of U.S. firms in the 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Overhead costs* is the bank's overhead costs, *Bank's profitability* is the profitability measure of banks, *Banking concentration* is the concentration measure for banks, *Bank assets ratio* is the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets, *Turnover ratio* is stock market turnover ratio. All these control variables are obtained from the Financial Development and Structure database of Beck, Demirguc-Kunt and Levine. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators. All regressions are estimated over 25 countries, 30 industries, and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the U.K. The industries that have missing observations for the external finance dependence measure are dropped from the above analysis. The estimation period in our regressions is 1996 – 2007. The above estimations include country, industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

Table 2.2.4: Gross Value Added Growth for European Industries with fixed effects, with further controls and legal origins

	Dependent Variables					
	All countries		**EU-15 countries**		**Non-EU 15 countries**	
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**	**(3) GVAGRO**	**(4) GVAGRO**	**(5) GVAGRO**	**(6) GVAGRO**
Log of Gross Value Added (lagged)	-0.00288*	-0.00288*	-0.00643**	-0.00643**	-0.00902**	-0.00902**
	(-1.774)	(-1.774)	(-2.261)	(-2.261)	(-2.325)	(-2.325)
	[0.00162]	[0.00162]	[0.00284]	[0.00284]	[0.00388]	[0.00388]
Harmonization	-0.00823	0.0210	0.0161*	-0.0222	-0.0278***	0.0921***
	(-1.434)	(1.110)	(1.943)	(-0.954)	(-3.814)	(2.979)
	[0.00574]	[0.0189]	[0.00827]	[0.0233]	[0.00729]	[0.0309]
Harmonizationdif		-0.0292		0.0383*		-0.120***
		(-1.495)		(1.698)		(-3.590)
		[0.0196]		[0.0226]		[0.0334]
Harmonization interaction $(Harmonization \times exf)$	-0.00881	-0.00881	-0.0153	-0.0153	0.0103	0.0103
	(-0.858)	(-0.858)	(-1.566)	(-1.566)	(0.483)	(0.483)
	[0.0103]	[0.0103]	[0.00975]	[0.00975]	[0.0213]	[0.0213]
Bank assets	-0.0194	-0.0194	0.153*	0.153*	-0.149*	-0.149*
	(-0.300)	(-0.300)	(1.787)	(1.787)	(-1.846)	(-1.846)
	[0.0647]	[0.0647]	[0.0855]	[0.0855]	[0.0805]	[0.0805]
Turnover ratio	-0.0163***	-0.0163***	-0.00345	-0.00345	-0.0334***	-0.0334***
	(-3.690)	(-3.690)	(-0.738)	(-0.738)	(-3.283)	(-3.283)
	[0.00441]	[0.00441]	[0.00467]	[0.00467]	[0.0102]	[0.0102]
Gov. Effectiveness	0.0267***	0.0267***	0.0153*	0.0153*	-0.00813	-0.00813
	(2.749)	(2.749)	(1.737)	(1.737)	(-0.246)	(-0.246)
	[0.00971]	[0.00971]	[0.00884]	[0.00884]	[0.0331]	[0.0331]
Regulatory quality	0.0322***	0.0322***	-0.00318	-0.00318	-0.00299	-0.00299
	(2.638)	(2.638)	(-0.208)	(-0.208)	(-0.143)	(-0.143)

	[0.0122]	[0.0122]	[0.0153]	[0.0153]	[0.0209]	[0.0209]
Rule of law	-0.0333**	-0.0333**	-0.0146	-0.0146	-0.0359	-0.0359
	(-2.397)	(-2.397)	(-0.880)	(-0.880)	(-1.411)	(-1.411)
	[0.0139]	[0.0139]	[0.0166]	[0.0166]	[0.0254]	[0.0254]
Legal origin British	0.0898	-0.00468	0.0114	0.0114	0.362***	-0.0255
	(1.412)	(-0.486)	(1.084)	(1.084)	(3.357)	(-1.112)
	[0.0636]	[0.00963]	[0.0105]	[0.0105]	[0.108]	[0.0230]
Legal origin French	0.0999	0.00538	0.000268	0.000268	0.387***	-
	(1.573)	(0.646)	(0.0307)	(0.0307)	(3.590)	
	[0.0635]	[0.00832]	[0.00873]	[0.00873]	[0.108]	
Legal origin Socialist	0.141**	0.0465***	-	-	0.429***	0.0412**
	(2.162)	(3.960)			(4.072)	(2.231)
	[0.0652]	[0.0117]			0.105	[0.0184]
Legal origin German	0.114*	0.0195**	0.0165*	0.0165*	-	-
	(1.772)	(2.289)	(1.756)	(1.756)		
	[0.0643]	[0.00851]	[0.00941]	[0.00941]		
Legal origin Scandinavian	0.0945	-	-	-		-
	(1.495)					
	[0.0632]					
Observations	7,012	7,012	4,134	4,134	2,878	2,878
R-squared	0.085	0.085	0.084	0.084	0.108	0.108

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $loggva_{i,s,t} - loggva_{i,s,t-1}$. Harmonization interaction$_{i,s,t}$ = Harmonizationi,t * exf$_s$, Harmonizationi,t = ln (1 + lex$_{i,t}$) where lex$_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. exf$_s$ is the external finance dependence of U.S. firms in the 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Bank assets ratio* is the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets, *Turnover ratio* is stock market turnover ratio, *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators. Legal origin dummy variables give the legal origins of the U.K., France, Socialist countries, Germany and Scandinavian countries respectively. The data for legal origins comes from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). The above estimations include the lagged logarithm of gross value added in levels. Regressions in columns (1) – (2) are estimated over 25 countries, 30 industries, and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy,

Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the U.K. Columns (3) – (4) are estimated over 15 countries, 30 industries and 12 years. The EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the U.K. Columns (5) – (6) are estimated over 10 countries, 30 industries and 12 years. The 10 non-EU 15 countries included are: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. The industries that have missing observations for the external finance dependence measure are dropped from the above analysis. The estimation period in our regressions is 1996 – 2007. The above estimations include industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

Table 2.2.5: Gross Value Added Growth for European Industries with fixed effects, with further controls and euro dummies

	Dependent Variables	
VARIABLES	**(1) GVAGRO**	**(2) GVAGRO**
Gross value added (Lagged)	-0.0104***	-0.0103***
	(-2.632)	(-2.623)
	[0.00393]	[0.00393]
Harmonization	0.0906***	0.0864***
	(3.040)	(2.938)
	[0.0298]	[0.0294]
Harmonizationdif	-0.105***	-0.102***
	(-3.449)	(-3.426)
	[0.0304]	[0.0299]
Harmonization interaction $(Harmonization \times exf)$	-0.00587	-0.00591
	(-0.572)	(-0.576)
	[0.0103]	[0.0103]
Bank assets ratio	-0.214***	-0.205**
	(-2.595)	(-2.482)
	[0.0824]	[0.0826]
Turnover ratio	-0.0107	-0.0116*
	(-1.552)	(-1.670)
	[0.00687]	[0.00696]
Government effectiveness	0.0352***	0.0376***
	(2.940)	(3.151)
	[0.0120]	[0.0119]
Regulatory quality	0.0912***	0.0855***
	(3.312)	(3.147)
	[0.0275]	[0.0272]
Rule of law	-0.0719***	-0.0682***

	(-3.089)	(-2.929)
	[0.0233]	[0.0233]
Euro	-0.0142	
	(-1.464)	
	[0.00967]	
Euro dummy		-0.0105
		(-0.557)
		[0.0188]
Observations	7,012	7,012
R-squared	0.097	0.097

Note: t – statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. GVAGRO = Gross value added growth is equal to the gross value added which is adjusted by the gross value added price indices, 1995 = 100 from the EU KLEMS database. GVAGRO is calculated as GVAGRO = $loggva_{i,s,t} - loggva_{i,s,t-1}$. Harmonization interaction$_{i,s,t}$ = Harmonization$_{i,t}$ * exf$_s$, Harmonization$_{i,t}$ = ln (1 + lex$_{i,t}$) where lex$_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. exf$_s$ is the external finance dependence of U.S. firms in the 1970s calculated by Rajan and Zingales (1998). $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Bank assets ratio* is the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets, *Turnover ratio* is stock market turnover ratio, *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators. *Euro* is a dummy variable that takes on a value of 1 on and after the date of implementation of the common currency, the Euro, and a value of 0 otherwise. *Euro dummy* is a dummy variable that takes on a value of 1 for the initial Euro adopter countries, and a value of 0 otherwise. The industries that have missing observations for the external finance dependence measure are dropped from the above analysis. The estimation period in our regressions is 1996 – 2007. The results reported are for 25 European countries, and 30 industries. The above estimations include industry, and time effects that are not reported here. t – statistics reported in the tables are based on country and industry-specific (clustered) heteroskedasticity and autocorrelation.

CHAPTER 3

Financial Harmonization and Financial Development: An Application of Europe's Financial Services Action Plan

Abstract

The Financial Services Action Plan (FSAP) of the European Commission intends to create an open, secure, integrated financial market across EU member countries. Although recent research has shown a positive impact of the FSAP directives on cross-border lending and industrial growth the effect on financial development remains to be examined. Using principal component analysis to construct financial, banking sector, bond and stock market development indices, we investigate the impact of financial harmonization policies of the FSAP on financial development in a panel of twenty five EU member states for the period of 1996 – 2007. Taking into account the timing perspective in implementing the FSAP directives across countries we find a positive link between financial harmonization and financial development. The results are shown to be robust to different approaches in constructing the harmonization index and the harmonization difference (relative timing of adoption) variable, adding further controls, and extending the analysis to include the data for the recent period.

3.1 Introduction

Financial development is a potential engine for growth. It is the channel through which countries experience increasing levels of efficiency in financial markets and the overall financial system. It improves the quality of financial intermediaries, frameworks, and activities promoting both growth and welfare within countries. The argument regarding the role of financial development has grown even stronger in recent years. Countries with developed and integrated financial markets are more likely to experience enhanced growth rates. If economic growth is a chain of events, financial development together with legal and institutional development constitutes the first link of this process. Differences in banking sector, stock and bond markets across countries matter in terms of achieving higher growth rates. Financial harmonization thereby becomes even more important in bringing together and accelerating further development of the financial markets.

The European Commission in hopes of harmonizing European countries has taken two important measures over the last two decades. The Euro, the first and well known measure of integration, has not only grown to be a leading currency in the world's financial markets, but has also greatly contributed to unifying European financial markets since its establishment back in 1999. Following the success of the Euro in creating unified financial system, the European Commission has introduced the second, less well known measure, the Financial Services Action Plan (FSAP). The FSAP aims to harmonize European financial markets through the imposition and adoption of regulatory and legislative frameworks. With the strategic objectives of ensuring "a single EU market for wholesale financial services", creating "open and secure retail markets, and state-of-the-art prudential rules and supervision" and establishing "wider conditions for an optimal single financial market", the FSAP intends to harmonize and reduce the costs of cross-border financial intermediation and transactions. (Hartmann, Maddaloni, and Manganelli, 2003, 34; Kalemli-Ozcan, Papaioannou, and Peydro, 2010 a).

Both the European Union and the European Commission have argued that financial harmonization, by reducing the cost of cross-border financial business, should increase economic growth leading to development of financial markets (FSA, 2003; London Economics, 2002). Ozkok (2012) has shown that once taking into account the relative timing of adoption of the FSAP measures, there is a positive link between financial harmonization and industrial growth. Grounding our analysis on that paper, we hope to answer the following question: Given the initial goal of the FSAP of creating an open, secure, integrated financial market, how effective have the directives of the FSAP been for financial development across countries? Using principal component analysis to construct financial, banking sector, bond and stock market development indices from most frequently used measures of financial development, we study the effects of financial harmonization policies of the FSAP on financial development in a panel of twenty five EU member states for the period of 1996 – 2007.

Based on the view of the European Commission, we would expect harmonization to have a positive impact on financial development across countries controlling for the relative timing of adoption of the FSAP measures. As expected, when regressing financial development indices on financial harmonization, we find a positive and significant impact. A number of robustness checks are carried out to examine whether our main result --- harmonization having a positive effect on financial development and the relative timing of adoption having a negative effect --- holds up. The results are mostly robust to controlling for legal origins of countries, constructing new harmonization and relative timing of adoption measures, and including data for recent years.

Our paper is related to different strands of the literature. First is the literature that has examined the effect of various types of integration on growth, volatility and development. For example, Jayaratne and Strahan (1996, 1998) and Strahan (2002) study the impact of branching deregulation and interstate banking on growth. The results reveal that following state-level branching deregulation, real per-capita economic growth across the U.S. states increased significantly. Policy changes that allow for higher integration, better bank monitoring and screening across states are found to be a possible explanation. In a more recent study, De Avila (2010), examining the effects of financial deregulation in Europe, shows that the process of capital control lifting and the harmonization of banking laws have enhanced the growth rates of European economies. Harmonization is found to be beneficial for growth through the increase in the level and efficiency of financial intermediation, whereas the liberalization of capital controls increased growth through improvements in financial intermediation. Similarly in studying the effects of financial integration on financial development Chinn and Ito (2002) and (2006), Ito (2006), Baltagi, Demetriades and Law (2007), Demetriades and Law (2006), Demetriades and Andrianova (2005) and Huang (2006) show that financial integration (capital account openness in most cases) contributes to financial development in equity and stock markets for both less developed and emerging market countries. More recently, Ozkok (2010) demonstrates that using index measures for financial openness and financial development in a panel study of developed and emerging market countries one can explain a large part of the variation in financial development across countries and over time. Principal component type indices provide better results in understanding the link between financial openness and financial development.

Second, there are some papers that have studied the FSAP measures. Kalemli – Ozcan, Papaioannou, and Peydro (2010 a) analyze the link between financial integration and business cycle synchronization. The authors' analysis, using bilateral panel instrumental variables to link legislative harmonization policies to output synchronization, depicts a negative relationship for the country-pairs selected in the sample. In an attempt to examine the Euro's effect on financial integration Kalemli – Ozcan, Papaioannou, and Peydro (2010 b) reveal the legislative-regulatory harmonization policies in financial markets established under the FSAP to be a contributing factor for cross-border lending, despite these policies' inability to explain the Euro's impact on financial integration. Ozkok (2012) conveys that there is a positive relationship between financial harmonization induced by the FSAP directives and industrial growth rates across countries controlling for the relative timing of adoption of these directives.

Our current analysis contributes to the literature in three aspects. First, we provide evidence for the link between financial harmonization and financial development. Second, following the argument for the use of index measures in Ozkok (2010) we further study the importance of indexing in the harmonization context. Lastly we explicitly examine the potential effect of one of the biggest European harmonization projects, the FSAP, on the development of the financial sector.

The rest of the paper is structured as follows. In the next section we explain in detail our data. Section 3 provides a discussion of the empirical model. Section 4 depicts our results and some robustness checks. Section 5 concludes.

3.2 Data

The analysis is based on annual data for 25 European countries over a 12 year period of 1996 – 2007.[64] The data are obtained primarily from Beck, Demirguc-Kunt, and Levine's database on *Financial Development and Structure* (referred as *BDL* from onwards), the World Bank's *World Development Indicators (WDI)*, *Worldwide Governance Indicators,* and *Edstats* which extracts data from the UNESCO Institute for Statistics.

3.2.1 Financial Harmonization

The financial harmonization measure of our analysis is based on the directives of the Financial Services Action Plan. The Financial Services Action Plan (FSAP) was launched by the European Union and the European Commission at the end of 1998 as a major 5-year program with the goals of establishing "a single EU wholesale market for financial services, open and secure retail markets, and state-of-the-art prudential and supervisory regulations." (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 b, 79).

The European Commission through the establishment of the FSAP aimed to remove barriers to entry into the financial sector, increasing competition, and harmonizing information (Malcolm, Tilden, and Wilsdon, 2009). However, like any legislative measure, the costs and benefits of the FSAP directives have become a topic of debate over the recent years. Boyfield, Robinson and Mullally (2006) state that the benefits involve increasing investment opportunities in securities markets across borders, easing the framework for investment firms, augmenting internalization and stimulating competition between banks. This thereby induces a reduction in the cost of trading and the cost of capital, increases investor confidence, market liquidity, and free flow of capital, allows for more transparency, and greater competition. The costs on the other hand entail compliance costs due to complexity, possibility of creating barriers to entry for smaller firms, further costs that involve execution of the directives, and costs of implementation of these directives across countries. The goal of the European Commission through the FSAP is to form a unified financial market that can act as an essential element for growth, employment and improved competition in the overall European system (European Commission, 2005). Financial Services Action Plan (FSAP) thereby should influence growth, and cross border lending across countries as shown in studies by Kalemli – Ozcan, Papaioannou, and Peydro (2010 b) and Ozkok (2012). Since the FSAP has been influential on financial activities across countries, it should have a positive impact on the banking sector, bond and stock market and overall level of financial development. The aim of this study thereby is to explore whether this is indeed the case.

The FSAP consists of 29 legislative acts, 27 directives and 2 regulations in corporate law, banking, payment systems and corporate governance (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a). The most important of these measures are the 27 directives, which will be the focus of the remainder of our analysis. The directives amend previous laws, replace out-of-date proposals or offer new legislative measures for the EU member countries. Since the establishment of the FSAP in 1998, the European Commission has passed 21 out of the 27 directives by the end of 2003, with the remaining 6 directives being passed into legislation during the period of 2004 – 2006 (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a).

[64] The data are obtained primarily from Beck, Demirguc-Kunt, and Levine's database on *Financial Development and Structure* (referred as *BDL* from onwards), the World Bank's *World Development Indicators (WDI)*, *Worldwide Governance Indicators,* and *Edstats* which extracts data from the UNESCO Institute for Statistics.

Unlike the EU regulations that are enforceable across countries immediately after their announcement, the FSAP directives are enforceable only after the member states pass legislations that adopt the EU law domestically (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a). The implementation stage of the FSAP directives involves the EU Commission's proposal on legislative directives and regulations, which then will have to be adopted by "co-decision" of the Council of Ministers of the Member States and the European Parliament (HM Treasury, The Financial Services Authority, and the Bank of England, 2003). The FSAP directives are incorporated into the national law of each EU member state either through introduction or through amendment of national laws within a time frame of 18 to 24 months of their date of original publication. The implementation process of the FSAP directives works through three stages; transposition of the EU legislation into national law, adjustment for necessary arrangements and ensuring that the newly adopted regulations are working effectively and efficiently. Due to differences across countries in modifying their existing internal institutional structures and frameworks to adopt the EU law (and due to the discretion in when to adopt these directives), the transposition of the FSAP directives may take several years, creating variation in terms of the dates of implementation of these directives in different countries.[65] For example, the 1998 Settlement Finality Directive (1998/26/EC) of the FSAP under the securities category was implemented into domestic law in Austria, Belgium, Finland, Germany, Ireland, the Netherlands, Spain and the U.K. within a year of its circulation. However, France, Italy and Luxembourg did not adopt this directive until 2001, while Cyprus, Czech Republic, Hungary, Latvia, Lithuania and Poland had not transposed the directive till the end of our sample period (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a, b).[66] It is this cross-country variation in the timing of the adoption of different directives which will allow us to identify their effect on growth.

The harmonization indices for EU countries are created using adoption dates of directives in different countries from the European Commission's Financial Services Action Plan. Following the methodology by Kalemli – Ozcan, Papaioannou, and Peydro (2010 b), we construct country and time-variant and industry-invariant indices of harmonization that summarize the information provided by the 27 FSAP directives. In particular, for each of the 27 directives listed under the FSAP we define a dummy variable that takes on a value of one on and after the date that the country under examination has transposed the directive into national law and a value of zero otherwise. The sum of all 27 directives forms our next variable, $lex_{i,t}$ (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 a, b):

$$lex_{i,t} = \sum_{k=1}^{27} Directives_{i,t}^{k} \qquad (3.1)$$

where *k* represents all 27 directive dummies, *i* represents the countries, and *t* represents the years in the sample. Following Kalemli – Ozcan, Papaioannou, and Peydro (2010 b), we use the logarithmic transformation of the sum of the directives for countries in constructing the harmonization index given below.

$$Harmonization_{i,t} = \ln(1 + lex_{i,t}) \qquad (3.2)$$

Table 3.1 in the Appendix provides a time-line of adoption of the 27 directives for all countries in our sample, while Table 3.2 and 3.3 present detailed descriptions and categories for these directives.

[65] As explained in Ozkok (2012) the European Commission imposes sanctions on member states that do not comply with the rules and regulations set forward by the Commission. The Member States are therefore obliged to pay penalties for the days of non-compliance. For more information please refer to the European Commission's Application of EU Law website, http://ec.europa.eu/eu_law/infringements/infringements_260_en.htm

[66] Please refer to Table 3.3 in the Appendix for further explanation of the directives in the Financial Services Action Plan.

The harmonization index described above takes into account the time varying sum of the directives across countries. We do not believe that this causes a potential problem or bias as countries are provided with a time frame in which they have to implement each directive into their national law. Nevertheless, it is also important and interesting to examine the fraction of the directives transposed each year given the possible number of directives that can possibly have been implemented in that year. We thereby construct another harmonization index that takes into account the fraction of directives implemented per year across countries relative to the possible sum of directives available for that year.[67] The fractional harmonization index can then be constructed as a possible robustness check as follows:

$$Harmonization_{i,t}(fraction) = \frac{lex_{i,t}}{\sum_t Directives\ possible\ _{i,t}} \qquad (3.3)$$

where $Directives\ possible\ _{i,t}$ represents the number of directives that can be implemented at each possible year and $lex_{i,t}$ is the sum of directives implemented across time per country.[68]

3.2.2 Relative timing (speed) of adoption

The relative timing of adoption is an important determinant of the effect of the FSAP directives. As shown in Ozkok (2012) there exist significant differences across EU member countries in the timing of adoption of the FSAP directives and not controlling for this timing would introduce a bias. As expressed previously, the FSAP directives need to be transposed into national law before they become effective. This has to be completed within a specified period of time, however, some countries implement directives earlier in comparison to others. These differences in timing of adoption are highly influential on the overall level of harmonization across countries. For example, if Czech Republic adopts a directive, and no other country adopts the same directive, then we cannot talk about harmonization. In that case Czech Republic would simply bear the cost of adopting the directive, without attaining any benefits from it. With this in mind, we consider whether there is a disadvantage from adopting these directives earlier. In order to check for this possibility, we construct a new variable which we call the harmonization difference:

$$Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$$

where $Harmonization_{i,t}$ is the harmonization index of country *i* in year *t*, and $Harmonizationave_t$ is the average index of harmonization across countries in year *t*. The harmonization difference is a measure that depicts how many FSAP directives are adopted by each country relative to the average rate of adoption for all countries per year. Using this variable we can analyze the impact of being an early versus a late adopter on industrial growth.

3.2.3 Financial Development Indicators

Financial development indicators consist of banking system, stock market and bond market measures. Below we discuss each group of measures and the construction of indices in detail.

Banking sector development indicators:

Five indicators are used to measure the development of the banking sector. These variables are liquid liabilities (% of GDP), private credit by deposit money banks and other financial institutions (% of GDP),

[67] We would like to thank Irma Clots-Figueras for pointing out this possibility.

[68] We have also experimented using the logarithmic transformation in the numerator of the fractional harmonization index. The results are similar to those reported in Table 3.6 in the appendix.

the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), total bank assets (% of GDP), and domestic credit provided by the banking sector (% of GDP). The annual data is obtained from *the Financial Development and Structure Database* by BDL and the World Bank's *WDI*.

Liquid liabilities (% of GDP) equals the ratio of liquid liabilities of bank and nonbank financial intermediaries to GDP (Demirguc-Kunt, Levine, 2001). This variable is commonly used as a measure of financial sector development and is a typical measure of financial depth.

Private credit by deposit money banks and other institutions (% of GDP) is an indicator for the overall development in private banking markets (Chinn and Ito, 2006). This variable includes financial resources provided to the private sector by deposit money banks and other financial institutions. It measures the level of credit available for the private sector.

The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages) is used to demonstrate the weight of deposit money bank assets among total assets. It reflects the importance of private lending compared to total lending (Huang, 2006).
Total bank assets (% of GDP) is used as a measure of financial depth. It is used to represent the overall size of the banking sector.

Domestic credit provided by the banking sector (% of GDP) includes credit extended to the private sector and general government, to the nonfinancial public sector in the form of investments in short- and long-term government securities, to banking and nonbank institutions and loans to state enterprises but excludes credit to the central government (World Bank, 2012). It is a measure of banking sector depth and financial sector development in terms of size (World Bank, 2012).

Stock market development indicators:

Three different variables are used to measure development in stock markets. These variables are *stock market capitalization (% of GDP), stock market turnover ratio (in percentages),* and *stock market total value traded (% of GDP)*. Annual data is obtained from the *Financial Development and Structure Database* of BDL.

Stock market capitalization (% of GDP) is equal to the value of listed shares divided by GDP. It is an indicator of the size of the stock market. *Stock market turnover ratio (in percentages)* is used as the efficiency indicator of stock markets (Demirguc-Kunt and Levine, 2001). It is classified as the ratio of the value of total shares traded to stock market capitalization. *Stock market total value traded (% of GDP)* is equal to the total shares traded on the stock market exchange divided by GDP. This indicator measures the activity or liquidity of the stock markets (Demirguc-Kunt and Levine, 2001).

Bond market development indicators:

Private bond market capitalization (% of GDP) and *public bond market capitalization (% of GDP)* are the two indicators used to measure bond market development. Data is reported annually from the *Financial Development and Structure database* of BDL.

Private bond market capitalization (% of GDP) is equal to the total amount of outstanding domestic debt securities issued by financial institutions and corporations as a share of GDP. *Public bond market capitalization (% of GDP)* is equal to the total amount of public domestic securities issued by

governments as a share of GDP. Both of these indicators are used to determine the efficiency of bond markets.

The financial development literature does not use bond market development indicators as potential measures for financial development. Due to their short period of availability bond market indicators may reduce the number of estimations or may create problems in estimations due to their large variability. Hence we also construct financial development indices that exclude the bond market development indicators.

3.2.4 Creating financial development indices

We argue for the use of indices for financial development for various reasons. First, the choice of indicators to be used is a topic of concern in the literature. Studies lack a comprehensive indicator that can bring together all features of financial development; the banking system, the stock and the bond markets. Second, with different measures used for financial development, the results obtained seem unconvincing. Constructing better financial development indices will help resolve problems associated with particular choice of measures. By aggregating different measures of financial development into a single index we summarize the comprehensive nature of the financial markets and bring together different sectors that affect financial development.

The use of principal components and factors models in creating indices have become more common among the researchers particularly in examining the link between financial openness and financial development and growth. Principal components analysis in its simplest form involves a mathematical procedure that helps transform a number of possibly correlated variables into a smaller number of uncorrelated ones. Principal components has two main objectives; reducing the dimensionality of the data set, and identifying new meaningful variables.[69] Here we use the methodology of Bo and Woo (2008) and apply it to our context following Ozkok (2010). This index calculates weights taking into account the information from all components. According to this methodology the weights for each measure of the index are constructed as follows:

$$w_j = \frac{\sum_{i=1}^{i=p} \lambda_i \alpha_j^i}{\sum_{i=1}^{i=p} \lambda_i}$$

where λ_i *(i =1,…,p)* is the i^{th} eigenvalue and α^i_{px1} (*i = 1, …, p)* is the i^{th} eigenvector of the correlation matrix R_{pxp} respectively (Bo and Woo, 2008). The technique used by Bo and Woo (2008) is similar to that proposed by the United Nations Conference on Trade and Development (UNCTAD) for constructing the Trade and Development Index. Bo and Woo (2008/2010), Nagar and Basu (2002) and Klein and Ozmucur (2002/2003) provide different approaches in creating indices analogous to the Trade and Development Index (TDI) with minor alterations.

The index is then constructed taking into account the relative importance of all indicators:

$$Index = \frac{\sum_{i=1}^{i=p} \sum_{j=1}^{i=p} \lambda_i \alpha_j^i x_j}{\sum_{i=1}^{i=p} \lambda_i} = \sum_{j=1}^{j=p} w_j \, x_j$$

[69] For a more in depth discussion of the principal component analysis please refer to Jackson (1991), Dunteman (1989) and Jolliffe (2002).

where x_j (j = 1, …, p) is the j^{th} column of the matrix X and w_j is the final weight of the indicator *j*. All variables that constitute the j^{th} column of the matrix X, x_j, are standardized. One important remark is in place; the sum of the weights expressed by the formula above does not necessarily have to equal unity. This is due to the fact that the principal component analysis in its underlining structure normalizes the mode of each eigenvector to unity. The weights therefore could be very close to but not always equal to 1 (Bo and Woo, 2008).

Following this methodology we construct indices with standardized individual measures for financial openness, banking sector, stock and bond market development, financial development.[70] This avoids any potential problem that could arise as a result of using different scales or units of measurement.

3.2.5 Control Variables

To further examine the relationship between financial harmonization and financial development we introduce a series of variables to control for legal and institutional differences, health care and education. Control variables described in detail below are country and time-variant for the period of 1996 – 2007. The data for the control variables are from the World Bank's *WDI* and the *Worldwide Governance Indicators*, and *Edstats.*

We employ a series of legal and institutional variables from the World Bank's *Worldwide Governance Indicators* dataset. We use three different measures to control for institutional, legal, political and economic factors that may affect the overall level of growth. The three indicators --- *government effectiveness*, *regulatory quality,* and *rule of law* --- are constructed using subjective and perceptions-based data that reflect views of a range of respondents, agencies and organizations. They are measured in a range from -2.5 to 2.5, where higher values correspond to better governance outcomes.[71]

Secondary school gross enrolment rate (% of population) is used as an indicator that controls for differences in educational attainment across countries. This measure is an important determinant of development. Following the examples of educational attainment indicators from the economic growth literature we use secondary school gross enrollment rate as a control for educational differences across countries.

Public health expenditure (% of government expenditure) is an indicator used for controlling funds provided for the health sector across countries. It consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants and social (or compulsory) health insurance funds (World Bank, 2012).[72]

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[70] This method makes use of all eigenvectors and proposes to use weights depending on the eigenvectors and eigenvalues.

[71] Please refer to the Worldwide Governance Indicators (WGI) dataset. 1996 – 2011. World Bank. http://info.worldbank.org/governance/wgi/resources.htm. The institutional quality variables used in our analysis do not fluctuate widely across time. Due to the relatively small fluctuation structure of these indicators, we take the averages of two consecutive years to replace the missing years' data for these three legal and institutional variables.

[72] The grants also include donations from international agencies and nongovernmental organizations. For further information please refer to http://data.worldbank.org/indicator/SH.XPD.PUBL.GX.ZS

Control variables help in further explaining the effect of financial harmonization on financial development as well as banking sector, bond and stock market development. The ease in adopting FSAP directives into national law can be induced by the quality of regulatory and legislative institutions. Education could be a factor in establishing human capital which would facilitate faster and simpler implementation of legislative policies. Health expenditure could be taken as an indicator of better functioning of countries. In order to control for these potential influences we include the variables discussed above in our regressions.

3.3 Empirical Model

We measure the effect of financial harmonization on financial development through an empirical model using fixed effects estimation. We follow the literature (Jayaratne and Strahan (1996), (1998), Strahan (2002), Morgan, Rime and Strahan (2004), and Kalemli – Ozcan, Papaioannou, and Peydro (2010 a, b)) and use a model which controls for average differences across countries and time in harmonization policies. We estimate the below benchmark empirical model in our estimations:

$$FD_{i,t} = \lambda_i + \theta_t + \beta_1 Harmonization_{i,t} + \beta_2 Harmonizationdif_{i,t} + \sum_{p=1}^{5} \tau_p \, Controls_{i,t}^{p} + v_{i,t}$$

where the dependent variable in the above equation is the index of financial development[73], λ_i represents country fixed effects, θ_t represents time fixed effects, $Harmonization_{i,t}$ is the index measure created using the FSAP directives, $Harmonizationdif_{i,t}$ is the relative timing of adoption of the FSAP directives measuring the difference between how much a country implements these directives in response to the average rate of adoption, and $Controls_{i,t}$ are the three legal and institutional quality variables of government effectiveness, regulatory quality and rule of law, secondary school enrollment rate, and the health expenditure.

In the above equation our main focus is on the coefficient of the harmonization index. We would expect to find a positive and significant coefficient for harmonization which would imply a positive link between financial harmonization and financial development. We convey our main findings for both the empirical model and robustness checks in detail in the next section.

3.4 Results

3.4.1 Benchmark Model

We report our results using 25 EU member countries for the period of 1996 – 2007. In our regressions we use fixed effects estimations with country and time specific effects. The results from Table 3.5 illustrate the effect of the harmonization index on financial development. Previous discussions had conveyed that through the Financial Services Action Plan, European economies would achieve an increase in the real GDP by 1.1% over a decade (FSA, 2003; London Economics, 2002). Although there is no clear explanation regarding how the FSAP would influence the level of financial development across countries, given its initial goal of creating a unified and integrated European financial market we would expect it to be one of the primary determinants of an increase in financial development both across countries and time. The

[73] We also use indices of banking sector, bond and stock market developments as dependent variables to analyze the impact of harmonization on different financial sectors.

results from Table 3.5 show that this is indeed the case. Controlling for the relative timing of adoption, the financial harmonization index is found to be positive and significant for all dependent variables of development with the exception of the bond market development index. Harmonization difference on the other hand takes on a negative effect implying that being an early adopter does not have a clear benefit in terms of financial development. The relative timing of adoption is shown to have a significantly disadvantageous effect on banking sector, stock market and financial development that excludes the bond market. The goal of unification of financial markets by the FSAP directives can only be mutually beneficial for countries when they all implement these directives.[74] Legal and institutional variables take on altering coefficients that are mostly insignificant. Health and education variables are generally positive and partly significant. This shows that health and educational attainment are contributing factors for financial development. In order to examine whether the inclusion of other control variables affect our results particularly for the banking sector we include further controls to our benchmark model. The results are reported below.

3.4.2 Robustness checks

As a first robustness check we examine our results with the harmonization index that takes into account the fraction of directives implemented. Constructing a harmonization index that depends on the fraction of the directives implemented we can observe whether countries adopt the FSAP directives in a timely manner. This index differs from our original measure by taking into account that not every year are newer FSAP directives proposed by the European Commission. As shown in equation (3), we expect this index to convey information regarding the adoption process of the directives rather than quantity of directives implemented per year. Our results from Table 3.6 (columns 1 to 5) report no significant relationship between the fractional harmonization index and the banking sector, bond and stock market and overall financial development indices. In order to examine whether the inclusion of a harmonization difference variable using the fractional argument would alter our findings, we construct the relative timing of adoption measure taking into account the fractions of directives as follows:

$$Harmondif(fra)_{i,t} = \frac{(lex_{i,t} - lex(ave)_{i,t})}{\sum_t Directives\ possible_{\,i,t}}$$

where $Directives\ possible_{\,i,t}$ represents the number of directives that can be implemented at each possible year, $lex_{i,t}$ is the sum of directives implemented across time per country and $lex(ave)_{i,t}$ is the mean of the country and time variant sum of directives.

The findings from columns (5) to (10) of Table 3.6 are mostly insignificant. The fractional harmonization index is insignificant for all dependent variables, whereas the harmonization difference measure is found to be positively significant for the financial development index that excludes the bond market. Nevertheless the fractional harmonization index should not be regarded as a substitute of the original harmonization index. The results portray that the effect of harmonization most probably does not work through a fractional argument. By using the fraction of directives implemented in the harmonization index we cannot find the positive and significant link that we examine when using the original logarithmic harmonization index.

Another potential concern may stem from the construction of the relative timing of adoption of the FSAP directives across countries. The 25 countries, although being a part of the most powerful economic and

[74] With the inclusion of the harmonization difference measure, the harmonization index acts like an average harmonization indicator that generates the impact of harmonization across countries at the average level.

political union in the world, differ from each other in terms of growth rates. Taking into account the differences across economies of the 25 EU countries we can construct a variable for relative timing of adoption such that it depends on the overall structure of the economy across countries. The relative timing of adoption measure created depends on the GDP levels. The weights for this variable are calculated as follows:

$$weight_{i,t} = \frac{GDP_{i,t}}{\sum_i GDP_{i,t}} \qquad (3.4)$$

where $GDP_{i,t}$ is the gross domestic product of country *i* given in constant 2000 USD from the World Bank's *World Development Indicators*. Similarly the relative timing of adoption measure, or in other words, the harmonization difference can be constructed as:

$$Harmonizationdif_{i,t} = Harmonization_{i,t} - \left(\sum_i weight_{i,t} \times Harmonization_{i,t}\right) \quad (3.5)$$

where $Harmonization_{i,t}$ is the harmonization index of the FSAP directives that is country and time variant. Using the above methodology each country takes on a weight that depends on the performance of their economy relative to the overall performance of the EU 25.

The results from Table 3.7 agree with those of the benchmark model. Harmonization index is positively significant for all development indices with the exception of the bond market development index, while the weighted harmonization difference variable takes on a negatively significant coefficient for most development indices, indicating that being an early adopter has a disadvantageous effect on financial development. The control variables of legal and institutional quality, together with education and health measures report coefficients similar to those of Table 5. Different constructions of the harmonization difference measure in computing the effect of early versus late harmonization on financial development show that harmonization is beneficial when all countries implement the directives around the same time.

As a third robustness check we reexamine the results by constructing two different harmonization indices. These two indices include the initial twenty-one directives that were put into force by the European Commission before the official completion of the FSAP directives in 2006, and the seven directives that correspond to the banking initiatives of the FSAP (Kalemli – Ozcan, Papaioannou, and Peydro, 2010 b). By doing so we hope to determine whether the effect of the harmonization process on financial development alters when we consider the initial 21 directives that were put into force long before the end of the FSAP and identify a possible significant link between the banking directives and financial development. The first alternative harmonization index includes twenty one directives excludes the directives implemented prior to 2004. It is constructed as:

$$lexro_{i,t} = \sum_{k=1}^{21} Directives_{i,t}^{k} \text{ and } Harmonization_{i,t}^{*} = \ln(1 + lexro_{i,t}) \qquad (3.6)$$

The second alternative to the harmonization index highlights the importance of the 7 banking directives of the FSAP. The banking harmonization index is then formed as:

$$banklex_{i,t} = \sum_{k=1}^{7} Directives_{i,t}^{k} \text{ and } Harmonization_{i,t}^{**} = \ln(1 + banklex_{i,t}) \quad (3.7)$$

The results from Tables 3.8 and 3.9 show that harmonization indices with initial 21 directives, and 7 banking directives have a positive effect on most financial development indices. Harmonization difference has a negative impact implying that being an early adopter is not beneficial for development. This shows

that the construction of the harmonization index is crucial, however, excluding some directives does not change the robustness of our benchmark model.

Additionally we check for the robustness of our results when accounting for legal origins. Legal origins refer to the differences across countries in legal systems that are structured according to families of law. Depending on the historical background and development of legal families, characteristics of the legal structures, and distinctive institutions, each country has a different legal tradition. As La Porta et al. present in their series of articles (1997, 1998, and 2008), the most popular legal traditions are the common law and the civil law from which several sub-traditions such as the French, German, socialist and Scandinavian legal origins arise.[75] Although for our purpose, there is not much difference between the French, German and British laws in terms of implementing the EU legislation proposed under the FSAP, the way these provisions will be carried out into domestic law, the manner that these directives will be monitored and enforced may show vast differences across member countries. This remains to be a factor too strong to forgo. Together with governmental and institutional factors, health and educational variables, differences in legal origins across countries may highly influence the link between financial harmonization and financial development. Our analysis with the addition of legal origins in Table 3.10 finds the effect of financial harmonization index to be positive and significant for all development indices with the exception of the bond market development index. Once again, the harmonization difference variable is shown to have a negative coefficient for most development indices. Although the legal origin dummies for the U.K., France, Germany, Socialist regimes, and Scandinavian countries appear to be negatively significant in some regressions, the coefficients alter signs depending on the dependent variables selected. The results correspond to those of the benchmark model of Table 3.5, demonstrating the robustness of our initial findings.

Lastly, we examine the effects of the recent financial crisis on the link between financial harmonization and financial development. Starting from 2008, the financial crisis has had a wide-spread effect on most European countries. Greece, Portugal, Ireland, Italy, Spain and recently Cyprus have had to deal with increasing levels of unemployment, large declines in growth rates, and worst of all with increasing levels of deficits and bankruptcy. Germany, France and the UK have experienced worsening of financial markets and a damaging slowdown of economic growth. In order to study the impact of the crisis on how the FSAP directives have been implemented across countries, we include the most recent years, for which data is available, in our analysis.[76]

The recent financial crisis has undermined the degree of integration across countries. As the fear of contagion of the detrimental outcomes of the crisis surges, harmonization and the relative timing of adoption of the FSAP directives could very well be negatively affected. The results from Table 3.11 show similarities to our benchmark model. Harmonization index is positive and significant for the financial development index that excludes the bond market, and for the banking sector development index.

In order to examine how harmonization has been affected by the recent financial crisis we include interaction terms of the explanatory variables in our model and analyze their behavior once the dataset is extended to include the crisis period. An indicator for the crisis period is initially constructed as a dummy variable that takes on a value of 1 on and after 2008, and a value of 0 otherwise. This term is then

[75] Please refer to La Porta et al. (2008). Legal origins dummies are obtained from the original La Porta et al. (1998) study and they are created by assigning a value of 1 for countries that have a specified legal tradition such as civil or common law, and 0 otherwise.

[76] The analysis includes the years of 2008, 2009 and 2010.

multiplied by the explanatory variables to construct interaction terms. The results reported in Table 3.12 convey a harmonization index that is positive and significant. The harmonization difference measure is similarly found to have a negative coefficient that is significant for most dependent variables. Examining the interaction terms, harmonization has a negative but insignificant coefficient. Figure 1 depicts the harmonization index and the harmonization variable. Similarly the graphs across countries do not convey a clear alteration of the rate of harmonization during 2008 – 2010. The crisis period does not seem to have affected the pace of the harmonization process. This could be the result of the last directives being established in 2006. Although by the end of our sample period there were countries remaining to implement some of the directives under the FSAP, most countries had already transposed majority of the directives into national law. Hence the positive impact of harmonization on financial, banking sector and bond and stock market development indices continues when we control for relative timing of adoption across countries. We have thereby shown that the link between financial harmonization and financial development is positive and robust.

3.5 Concluding Remarks

The Financial Services Action Plan (FSAP) was established with the initiative of building an integrated and harmonized financial market among its member states. After the implementation of the Euro, the FSAP directives have constituted a further step in bringing together European countries through legislative and regulatory terms in banking, insurance and securities markets.

The literature has shown a positive impact of financial harmonization (from the FSAP directives) on cross-border lending and industrial growth across countries. Given that the FSAP directives aim to create open and secure financial markets, we have assessed the effect of these directives on the development of financial markets. With a standard fixed effects estimation--- regressing financial, banking, bond and stock market development indices constructed using principal components analysis on harmonization and controlling for country and time fixed effects and the relative timing of adoption of the directives --- we find that there is a positive relationship between financial harmonization and financial development. The results are shown to be robust to different approaches in constructing the harmonization index and the harmonization difference variable, including other control variables such as dummies for legal origins, and extending the dataset to include the crisis period.

This paper has shown that by taking into account the timing perspective in implementing the FSAP directives across countries we can find a positive link between financial harmonization and financial development. The transposition of the FSAP directives has been shown to positively affect our financial development indices. This however does not imply that the FSAP directives have entirely been successful in realizing their initial objectives. There existed countries by the end of our sample period, by 2010, which had not implemented all the directives. Although the last FSAP directives had been established in 2006, some countries have taken a longer time frame in adopting them. This could be a result of the costs attached to the implementation of the directives. As the Financial Services Action Plan nears completion in terms of full adoption with the remaining countries implementing the directives, the cost and benefit debate is ongoing. Having shown that the relative timing of adoption is key to understanding the impact of harmonization policies on financial development, future research, as more data become available, would call for a cost and benefit analysis of the FSAP directives. Such an analysis will clear doubts on the implementation stage of the FSAP and on its timing, and thereby provide a full picture on the efficiency of these directives.

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3.7 Appendix

Table 3.1: Timing of the FSAP Directives for the EU Member Countries

Directives	AT	BE	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV
1998/26/EC	1999	1999	Not Yet	Not Yet	2000	2004	1999	2001	1999	2000	Not Yet	1999	2001	Not Yet
2000/46/EC	2002	2003	2004	2003	2005	2006	2003	2003	2002	2003	2004	2002	2002	2004
2000/64/EC	2003	2004	2002	2004	2004	2001	2004	2006	2002	2004	2002	Not Yet	Not Yet	2004
2001/17/EC	2003	2004	2004	2004	2006	2005	2004	2005	2003	Not Yet	2004	2003	2003	2004
2001/24/EC	2003	2004	2004	2005	2004	2005	2004	2004	2004	2006	2004	2004	2004	2004
2001/65/EC	2004	2005	2003	2004	2002	2004	2004	2004	2004	2006	2004	2004	2005	1993
2001/86/EC	2004	2004	2004	2004	2004	2005	2004	2005	2004	2006	2004	2006	2005	2005
2001/97/EC	2003	2004	2003	2004	2005	2004	2003	2004	2002	2005	2003	2003	2004	2004
2001/107/EC	2003	2004	2004	2004	2004	2004	2004	2003	2004	2004	2003	2003	2003	2005
2001/108/EC	2003	2004	2004	2004	2005	2004	2004	2003	2004	2004	2003	2003	2003	2004
2002/13/EC	2003	2004	2004	2004	2004	2005	2004	2004	2004	2005	2004	2005	2004	1998
2002/47/EC	2003	2005	2004	2005	2004	2004	2004	2005	2004	2004	2004	2004	2004	2005
2002/65/EC	2004	2006	2004	2004	2005	2004	2005	2005	2004	2005	2005	2004	2005	2004
2002/87/EC	2005	2005	2005	2005	2004	2005	2004	2004	2005	2006	2004	2005	2005	2005
2002/83/EC	2003	2004	2004	2004	2004	2005	2004	2004	2004	2005	2004	2005	2004	1998
2002/92/EC	2004	2005	2004	2005	2005	2005	2005	2005	Not Yet	2005	2005	2005	2006	2005
2003/6/EC	2005	2005	2005	2006	2005	2005	2005	2005	2004	2005	2005	2005	2005	2005
2003/41/EC	2005	2006	2006	2006	2005	2004	2006	2006	2005	2005	2005	2005	Not Yet	2005
2003/48/EC	2004	2005	2005	2004	2004	2004	2004	2003	2005	2005	2003	2003	2005	2005
2003/51/EC	2005	2006	2005	2004	2002	2005	2004	2004	2004	2006	2005	2005	Not Yet	1993
2003/71/EC	2005	2006	2005	2006	2005	2005	2005	2005	2005	2005	2005	2005	Not Yet	2005
2004/25/EC	2006	2007	2007	2006	2005	2007	2006	2006	2006	2006	Not Yet	2006	2007	2006
2004/109/EC	2007	2007	2009	2006	2007	2007	2007	2007	2007	2007	Not Yet	2007	2007	2007
2004/39/EC	2007	2008	2010	2006	2007	2007	2007	2007	2007	2007	Not Yet	2007	2007	2008
2005/56/EC	2007	2008	2007	Not Yet	2007	2008	2007	2008	2007	2009	Not Yet	2008	2008	2010
2006/48/EC	2007	2007	Not Yet	Not Yet	2007	2007	2007	2007	2006	2007	Not Yet	2007	2007	2010
2006/49/EC	2007	2007	Not Yet	2006	2007	2007	2007	2007	2006	2007	Not Yet	2007	2007	2010

Directives	LT	LU	MT	NL	PL	PT	SK	SI	ES	SE	UK
1998/26/EC	Not Yet	2001	2002	1999	Not Yet	2000	2006	2004	1999	2000	1999
2000/46/EC	2005	2002	2002	2002	2003	2002	2004	2006	2002	2002	2002
2000/64/EC	2004	2001	2002	2003	2004	2000	2006	2004	2002	2000	2003
2001/17/EC	2004	2004	2004	2004	2004	2003	2005	2004	2003	2006	2003
2001/24/EC	2005	2004	2004	2005	2004	2006	2005	2004	2005	2006	2004
2001/65/EC	2004	2006	2001	2005	1995	2004	2005	2004	2004	2004	2004
2001/86/EC	2005	2006	2004	2005	2005	2005	2004	2006	2006	2004	2004
2001/97/EC	2004	2004	2003	2001	2001	2004	2006	2002	2003	2005	2004
2001/107/EC	2003	2003	2004	2005	2004	2004	2004	2004	2004	2004	2004
2001/108/EC	2003	2003	2004	2005	2004	2004	2004	2004	2004	2004	2004
2002/13/EC	2004	2004	2004	2003	2004	2003	2004	2004	2004	2004	2004
2002/47/EC	2004	2005	2005	2004	2004	2004	2005	2003	2002	2005	2005
2002/65/EC	2004	Not Yet	2005	2006	2000	Not Yet	2005	Not Yet	Not Yet	2004	2004
2002/87/EC	2004	2006	2005	2007	2005	Not Yet	2006	2006	2005	2006	2004
2002/83/EC	2004	2004	2004	2003	2004	2003	2004	2004	2004	2004	2005
2002/92/EC	2004	2005	2006	2005	2004	2006	2005	2004	2006	2005	2005
2003/6/EC	2004	2006	2005	2005	2005	2006	2006	2004	2005	2005	2005
2003/41/EC	2006	2005	2004	2006	1999	2006	2005	2003	2005	2006	2005
2003/48/EC	2005	2005	2004	2004	2005	2005	2005	2006	2004	2005	2005
2003/51/EC	2003	2006	2002	2005	1995	2005	2005	Not Yet	2005	2006	2005
2003/71/EC	2005	2005	2005	2005	2005	2005	2005	2006	2005	2005	2005
2004/25/EC	2007	2006	2006	2007	2009	2006	2007	2006	2007	2006	2006
2004/109/EC	2007	2007	2007	Not Yet	Not Yet	2007	Not Yet	2007	2007	2007	2007
2004/39/EC	2008	2008	2007	2007	Not Yet	2007	2007	2007	2007	2007	2007
2005/56/EC	2012	2007	2007	2008	2008	Not Yet	Not Yet	2008	2009	2008	2007
2006/48/EC	2011	2007	2007	2007	2010	2007	Not Yet	2007	2008	2007	2007
2006/49/EC	2008	2008	2007	2007	2010	2007	2007	2007	2008	2007	2007

Sources: Kalemli – Ozcan, Sebnem, Elias Papaioannou, and Jose Luis Peydro. (2010 b). "What Lies Beneath the Euro's Effect of Financial Integration? Currency Risk, Legal Harmonization, or Trade?", *Journal of International Economics*, 81 (1): 75 – 88, European Commission. 2010. "Transposition of Financial Services Action Plan" http://ec.europa.eu/internal_market/finances/actionplan/transposition/database/austria_en.htm, and Europa, Access to European Union Law National Execution Measures, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:72006L0049:EN:NOT#FIELD_MT

Table 3.2: Directives of the Financial Services Action Plan (FSAP)

Directives	***Directive Names***	***Deadline***	***Category***
1998/26/EC	Settlement Finality Directive	1/06/2005	Securities
2000/46/EC	Directive on the taking up, pursuit and prudential supervision of the businesses of electronic money institutions (E-Money Directive)	27/04/2002	Banking
2000/64/EC	Directive amending the insurance directives and the ISD to permit information exchange with third countries	17/11/2002	Insurance
2001/17/EC	Directive on the reorganization and winding-up of insurance undertakings	20/04/2003	Insurance
2001/24/EC	Directive on the reorganization and winding-up of banks	5/05/2004	Banking
2001/65/EC	Directive amending the 4th and the 7th Company Law Directives to allow fair value accounting	9/10/2004	Securities
2001/86/EC	Directive supplementing the Statute for a European Company with regard to the involvement of employees	10/10/2004	Securities
2001/97/EC	Directive amending the money laundering directive (2nd Money Laundering Directive)	15/06/2003	Banking
2001/107/EC	1st Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	13/08/2003	Securities
2001/108/EC	2nd Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	13/08/2003	Securities
2002/13/EC	Directive amending the solvency margin requirements in the insurance directives	20/09/2003	Insurance
2002/47/EC	Directive on financial collateral arrangements	17/12/2003	Securities
2002/65/EC	Directive on the Distance of marketing of Financial Services	1/01/2004	Insurance
2002/87/EC	Directive on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate (Financial Conglomerates Directive)	11/08/2004	Banking
2002/83/EC	Directive amending the solvency margin requirements in the insurance directives	20/09/2003	Insurance
2002/92/EC	Directive on insurance mediation	15/01/2005	Insurance
2003/6/EC	Directive on insider dealing and market manipulation	12/10/2004	Securities
2003/41/EC	Directive on the prudential supervision of pension funds	23/09/2005	Insurance

2003/48/EC	Directive on the taxation of savings income in the form of interest payments (Savings Tax Directive)	1/01/2004	Banking
2003/51/EC	Directive modernizing the accounting provisions of the 4th and the 7th Company Law Directives	1/01/2005	Securities
2003/71/EC	Directive on prospectuses	1/07/2005	Securities
2004/25/EC	Directive on Take Over Bids	20/5/2006	Securities
2004/109/EC	Transparency directive	20/01/2007	Securities
2004/39/EC	Directive on Markets in Financial Instruments (update of ISD) - MiFID	20/01/2007	Securities
2005/56/EC	10th Company Law Directive on cross-border mergers of limited liability companies	15/12/2007	Securities
2006/48/EC	Directive on the relating to the taking up and pursuit of the business of credit institutions	31/12/2006	Banking
2006/49/EC	Directive on the capital adequacy of investment firms and credit institutions	31/12/2006	Banking

Sources: Kalemli – Ozcan, Sebnem, Elias Papaioannou, and Jose Luis Peydro. (2010 b). "What Lies Beneath the Euro's Effect of Financial Integration? Currency Risk, Legal Harmonization, or Trade?", *Journal of International Economics*, 81 (1): 75 – 88 and Supplementary Appendix Table A, http://www.dartmouth.edu/~elias/jie_SAT-A.pdf, European Commission. 2010. Transposition of Financial Services Action Plan http://ec.europa.eu/internal_market/finances/actionplan/transposition/database/austria_en.htm

Table 3.3: Description of the Directives of the Financial Services Action Plan

Directive	Directive No.	Deadline
Settlement Finality Directive	1998/26/EC	01/06/2005
This directive is implemented to reduce systemic risk in payment and securities settlement systems, particularly aiming to reduce the risk of insolvency of a member country. Main objectives of this directive include protection of transfer orders, greater competition between settlement providers and the removal of barriers to post-trading.		
Directive on the taking up, pursuit and prudential supervision of the businesses of electronic money institutions (E-Money Directive)	2000/46/EC	27/04/2002
The E-Money directive defines electronic money and sets conditions for capital and authorization requirements of electronic money institutions. Main objectives of this directive are to implement appropriate prudential rules and encourage innovation and confidence so as to boost the number of passports used in the banking system as well as to increase the use of e-money.		
Directive amending the insurance directives and the ISD to permit information exchange with third countries	2000/64/EC	17/11/2002
This directive allows for the exchange of information between the third country authorities and authorities of the Member States. It allows for the conclusion of cooperation agreements by the Member States providing an environment for exchange of information with the authorities of third countries.		
Directive on the reorganization and winding-up of insurance undertakings	2001/17/EC	20/04/2003
This directive aims to ensure that mutual recognition is applied to the winding-up and reorganization of insurance undertakings within the EU. The main objectives of this directive include reducing regulatory requirements regarding bankruptcy and increasing consumer protection in order to create more cross-border business through branches and more direct cross-border insurance.		
Directive on the reorganization and winding-up of banks	2001/24/EC	05/05/2004
This directive ensures that the banks across the Member States can be wound up and reorganized as a single entity. The main objectives of this directive include reducing regulatory requirements regarding bankruptcy and increasing consumer protection.		
Directive amending the 4th and the 7th Company Law Directives to allow fair value accounting	2001/65/EC	09/10/2004

This directive highlights the existing EU Accounting Directives for companies, banks and other financial institutions and concentrates on the valuation of assets. It aims to achieve a single set of financial statements for listed companies across Member States. The directive is intended to establish greater transparency, increased investment and information disclosure.

Directive supplementing the Statute for a European Company with regard to the involvement of employees	2001/86/EC	10/10/2004

This directive provides provisions for the creation of a Statute for a European company particularly for employee involvement.

Directive amending the money laundering directive (2nd Money Laundering Directive)	2001/97/EC	15/06/2003

This directive highlights the importance of the scope of predicate offences and the reporting of suspicious activity in banking. It is established in order to cut funding for organized crime and terrorism. Its main objectives include increasing market confidence, reducing money laundering, and decreasing the risk of banking crises.

1st Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	2001/107/EC	13/08/2003

This directive aims to regulate management companies and provide simplified prospectuses for investment purposes. It promotes the consolidation of EU funds and generation of economies of scale. By providing greater flexibility for fund managers, this directive hopes to increase cross border trade in UCITS.

2nd Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	2001/108/EC	13/08/2003

This directive has the objectives of harmonizing information to investors, expanding investment options, providing a larger number of passports to ease cross border trade, and increasing the use of eligible assets so as to allow for quicker diffusion of products.

Directive amending the solvency margin requirements in the insurance directives	2002/13/EC	20/09/2003

This directive was implemented in order to improve prudential regulation of insurance companies. It addresses the reduction in the amount of regulatory capital an insurance undertaking is obliged to hold against unforeseen conditions, as well as aiming to simplify regulation and increase consumer protection.

Directive on financial collateral arrangements	2002/47/EC	17/12/2003

This directive creates greater enforceability for collateral backing transactions across the Member States. It aims to reduce systemic risk in securities settlement and the cost of capital, provide a harmonized legal treatment of financial collateral, and increase cross-border trading.

Directive on the Distance of marketing of Financial Services	2002/65/EC	01/01/2004

This directive helps in protecting retail consumers of financial products sold at a distance. It aims to remove barriers to cross-border provision and expects to achieve higher cross-border consolidation in insurance through M&A activity. This directive provides higher protection for retail consumers and helps increase the levels of competition between suppliers throughout Member States.

Directive on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate (Financial Conglomerates Directive)	2002/87/EC	11/08/2004
This directive provides a settlement on how the lead supervisor of a financial conglomerate should be decided and how supervisory arrangements should be fulfilled. It aims to ensure soundness of financial institutions through better prudential regulation such as risk reflective capital levels, improved risk management, and harmonization of cross-border and cross-sector supervision.		
Directive amending the solvency margin requirements in the insurance directives (Solvency 1 directive for life insurance)	2002/83/EC	20/09/2003
This directive aims to increase consumer protection and lower the costs for the insurance sector. It helps merge national markets so as to achieve a highly integrated single market in terms of life insurance.		
Directive on insurance mediation	2002/92/EC	15/01/2005
This directive is proposed to remove barriers to insurance intermediaries, enhance consumer protection and encourage retail insurance across borders of Member States. It brings together the issues regarding authorization, capitalization and regulation of intermediaries and brokers who sell insurance products under a single framework. It aims to provide higher quality advice and products in the insurance sector as well as to increase cross-border consolidation in insurance.		
Directive on insider dealing and market manipulation (Market Abuse Directive)	2003/6/EC	12/10/2004
This directive is aimed to terminate market abuse and insider trading. It is established to improve market transparency and confidence, and increase investment. Through this directive the markets are assumed to be more effectively protected against abuse due to the new changes that relate to mandatory suspicious transaction reporting.		
Directive on the prudential supervision of pension funds	2003/41/EC	23/09/2005
This directive brings new regulation to the operation of employment-related pension schemes across Member States. It aims to create an internal market that will allow for occupational retirement provision organized in a European scale.		
Directive on the taxation of savings income in the form of interest payments (Savings Tax Directive)	2003/48/EC	01/01/2004
This directive is implemented to prevent cross-border tax evasion by individuals within the EU. Through this directive, the Member States will be able to exchange information on interest income paid to non-residents or to tax that particular income.		
Directive modernizing the accounting provisions of the 4th and the 7th Company Law Directives	2003/51/EC	01/01/2005
This directive hopes to improve transparency in standards of corporate reporting. It aims to enhance investor confidence and to increase competition in the investment market and information quality.		
Directive on prospectuses	2003/71/EC	01/07/2005

This directive is established to increase transparency and investor confidence in the securities markets across Member States. It proposes passporting of prospectuses that are to be published for securities trade to the public across the EU borders so as to achieve a more competitive market for issuers and investors. This directive provides a single passport for issuers of equity and debt securities easing the transactions of securities across the EU borders. It aims to harmonize information, promote a more competitive EU market in securities, and reduce the cost of capital.

Directive on Take Over Bids	2004/25/EC	20/05/2006

This directive is implemented to promote free market in corporate control and enhance competition in securities markets. It aims to implement a minimum framework to the national approval of takeovers in applicable law, protection of shareholders and disclosure. Its main objective includes insurance of an efficient market for M&A activity through which merger related costs and increase cross-border activity in M&A will be reduced.

Transparency directive	2004/109/EC	20/01/2007

This directive aims to increase the quality of information available to investors in the securities market and promote a more competitive investment market. It proposes an obligation on issuers of securities to meet continuing disclosure requirements after the issue.

Directive on markets in Financial Instruments (update of ISD) – MiFID	2004/39/EC	20/01/2007

This directive aims to create an integrated single European market of financial instruments. It promotes banks to internalize trading across Europe and compete with exchanges. Through greater internalization across banks, this directive hopes to increase competition, reduce the cost of capital and enhance fair competition between exchanges and banks. This directive is expected to create appropriate investor protection, single passport for securities trade, remove barriers to entry for exchanges and increase competition between trading venues.

10th Company Law Directive on cross-border mergers of limited liability companies	2005/56/EC	15/12/2007

This directive is created to allow companies to conduct cross-border mergers. It ensures efficient market for M&A activity. It aims to decrease merger related costs and increase cross-border M&A activity. It provides a more secure and transparent environment for cross-border restructuring.

Directive on the relating to the taking up and pursuit of the business of credit institutions	2006/48/EC	31/12/2006

This directive is established to coordinate credit institutions in order to protect savings and to create equal conditions of competition between institutions.

Directive on the capital adequacy of investment firms and credit institutions	2006/49/EC	31/12/2006

This directive establishes the capital adequacy requirements for investment firms and credit institutions, setting the rules for their prudential supervision. Its main objectives include harmonization of capital adequacy of investment firms and credit institutions, enhancement of effective risk management for banks, and the creation of a safer environment that would decrease possibility for banking crises.

Source: The definitions for the directives are collected from the following: Kalemli – Ozcan, Sebnem, Elias Papaioannou, and Jose Luis Peydro. (2010 b). "What Lies Beneath the Euro's Effect of Financial Integration? Currency Risk, Legal Harmonization, or Trade?", *Journal of International Economics*, 81 (1): 75 – 88 and Supplementary Appendix Table A, http://www.dartmouth.edu/~elias/jie_SAT-A.pdf, European Commission. 2010. Transposition of Financial Services Action Plan http://ec.europa.eu/internal_market/finances/actionplan/transposition/database/austria_en.htm, Boyfield, Keith, Hugo Robinson, and Lorraine Mullally. (2006). "Selling the City Short? A Review of the EU's Financial Services Action Plan", *Open Europe*, 1 – 119, (http://www.openeurope.org.uk/Content/Documents/PDFs/fsap.pdf), Malcolm, Kyla, Mark Tilden, and Tim Wilsdon. (2009). "Evaluation of the economic impacts of the Financial Services Action Plan", *European Commission Internal Market and Services Final Report*, 1 – 243

Table 3.4: Summary Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Financial development	145	0.38678	0.8669	-1.5686	2.4907
Financial development*	202	0.08187	1.2056	-2.6924	4.0789
Banking sector development	205	0.05424	1.3383	-3.0448	3.2115
Bond market development	214	0.01414	0.7352	-0.8746	2.9753
Stock market development	297	0.00330	1.1153	-1.3210	4.3889
Harmonization	300	1.34614	1.2694	0	3.3322
Harmonization difference	300	0.00003	0.3694	-1.5349	1.5011
Government effectiveness	300	1.28349	0.5706	0.0782	2.3379
Regulatory quality	300	1.26356	0.3753	0.4393	2.0578
Rule of Law	300	1.19809	0.5241	0.1039	2.0142
Health	300	12.7227	2.5069	4.8078	18.3899
Education	290	103.988	14.609	81.322	162.349

Note: *Financial development, banking sector development, stock* and *bond market development* indices are constructed using the principal components analysis. *Financial development** is a principal components index that excludes the bond market development indicators. *Harmonization* is the harmonization index constructed using the directives of the Financial Services Action Plan. *Harmonization difference* is the difference between a country's harmonization index and average harmonization for that particular year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators. *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate.

Table 3.5: Financial development, financial harmonization and relative timing of adoption

	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization	0.305***	0.549***	0.360***	0.0296	0.453***
	(3.801)	(5.762)	(4.319)	(0.505)	(6.450)
	[0.0801]	[0.0953]	[0.0834]	[0.0586]	[0.0702]
Harmonizationdif	-0.116	-0.497***	-0.407**	-0.0649	-0.321***
	(-0.838)	(-3.682)	(-2.777)	(-0.631)	(-3.558)
	[0.138]	[0.135]	[0.146]	[0.103]	[0.0901]
Government effectiveness	-0.253	-0.272	-0.149	-0.00626	-0.324**
	(-1.209)	(-1.679)	(-0.694)	(-0.0350)	(-2.121)
	[0.209]	[0.162]	[0.215]	[0.179]	[0.153]
Regulatory quality	-0.479*	-0.378	-0.262	-0.301	0.242
	(-1.929)	(-0.959)	(-0.582)	(-1.139)	(0.713)
	[0.248]	[0.394]	[0.450]	[0.264]	[0.339]
Rule of law	0.904*	0.0529	0.714	0.723	-0.553**
	(1.856)	(0.124)	(1.454)	(1.032)	(-2.068)
	[0.487]	[0.427]	[0.491]	[0.701]	[0.267]
Health	0.155**	0.0869	0.111	0.131**	-0.0118
	(2.540)	(1.254)	(1.465)	(2.723)	(-0.339)
	[0.0610]	[0.0694]	[0.0760]	[0.0480]	[0.0348]
Education	0.0116*	0.00297	0.00891	0.00900	-0.00621*
	(1.986)	(0.494)	(1.511)	(1.593)	(-1.977)
	[0.00583]	[0.00600]	[0.00590]	[0.00565]	[0.00314]
Observations	141	194	196	209	288
R-squared	0.721	0.728	0.629	0.339	0.517
Number of countries	20	25	25	22	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. $Harmonization_{i,t} = \ln(1 + lex_{i,t})$ where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the *Worldwide Governance Indicators*, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. The regressions are estimated over 25 countries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2007. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Table 3.6: Financial development and financial harmonization constructed using fractions

	Dependent Variables									
VARIABLES	**(1) Financial dev.**	**(2) Financial dev.***	**(3) Banking sector dev.**	**(4) Bond market dev.**	**(5) Stock market dev.**	**(6) Financial dev.**	**(7) Financial dev.***	**(8) Banking sector dev.**	**(9) Bond market dev.**	**(10) Stock market dev.**
Harmonization (Fractional)	0.247	0.00154	-0.165	-0.0242	0.201	-0.172	-0.128	-0.311	0.0911	0.0922
	(1.156)	(0.00683)	(-0.696)	(-0.258)	(1.601)	(-0.690)	(-0.565)	(-1.272)	(0.755)	(0.667)
	[0.214]	[0.225]	[0.237]	[0.0940]	[0.126]	[0.249]	[0.226]	[0.244]	[0.121]	[0.138]
Harmonizationdif (Fractional)						0.248*	0.0180	0.0772	-0.0999	-0.0194
						(1.873)	(0.296)	(1.094)	(-1.331)	(-0.435)
						[0.133]	[0.0609]	[0.0705]	[0.0750]	[0.0447]
Government effectiveness	-0.222	-0.273	-0.156	-0.00599	-0.344**	-0.0808	-0.303*	-0.126	-0.0189	-0.370***
	(-1.086)	(-1.674)	(-0.724)	(-0.0337)	(-2.203)	(-0.447)	(-1.813)	(-0.743)	(-0.123)	(-2.917)
	[0.204]	[0.163]	[0.215]	[0.178]	[0.156]	[0.181]	[0.167]	[0.170]	[0.154]	[0.127]
Regulatory quality	-0.499*	-0.369	-0.226	-0.294	0.214	-0.370	-0.372	-0.367	-0.312	0.0951
	(-1.950)	(-0.929)	(-0.501)	(-1.100)	(0.632)	(-1.240)	(-0.830)	(-0.886)	(-1.088)	(0.425)
	[0.256]	[0.397]	[0.451]	[0.267]	[0.339]	[0.298]	[0.448]	[0.414]	[0.286]	[0.224]
Rule of law	0.848*	0.0366	0.705	0.714	-0.532*	0.573	0.283	0.659	0.762	-0.217
	(1.758)	(0.0886)	(1.454)	(1.009)	(-2.016)	(1.070)	(0.590)	(1.321)	(0.965)	(-1.059)
	[0.482]	[0.414]	[0.485]	[0.708]	[0.264]	[0.536]	[0.480]	[0.499]	[0.790]	[0.205]
Health	0.149**	0.0863	0.114	0.131**	-0.0149	0.107*	0.0807	0.117	0.124**	-0.0188
	(2.426)	(1.239)	(1.531)	(2.711)	(-0.420)	(1.841)	(1.123)	(1.475)	(2.552)	(-0.520)
	[0.0616]	[0.0696]	[0.0745]	[0.0482]	[0.0355]	[0.0581]	0.0718	[0.0790]	[0.0484]	[0.0362]
Education	0.0110*	0.00273	0.00884	0.00907	-0.00634**	0.0131***	0.00156	0.00908*	0.0105*	-0.00618**
	(2.035)	(0.459)	(1.506)	(1.584)	(-2.086)	(4.573)	(0.304)	(1.873)	(1.789)	(-2.404)
	[0.00543]	[0.00595]	[0.00587]	[0.00572]	[0.00304]	[0.00286]	[0.00511]	[0.00485]	[0.00585]	[0.00257]
Observations	141	194	196	209	288	115	157	157	178	246
R-squared	0.718	0.727	0.630	0.338	0.517	0.720	0.658	0.606	0.358	0.458
Number of countries	20	25	25	22	25	18	22	22	21	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. $Harmonization_{i,t}(fraction) = \frac{lex_{i,t}}{\sum_t Directives\ possible\ _{i,t}}$ where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. Similarly the relative timing of adoption measure is constructed as $Harmondif(fra)_{i,t} = \frac{(lex_{i,t} - lex(ave)_{i,t})}{\sum_t Directives\ possible\ _{i,t}}$ where $lex(ave)_{I,t}$ is the average of the sum of all 27 directives adopter per country across time. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the *Worldwide Governance Indicators*, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. The regressions are estimated over 25 countries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2007. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Table 3.7: Financial development, financial harmonization, with a different relative timing of adoption measure

	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization	0.301***	0.535***	0.348***	0.0277	0.443***
	(3.878)	(5.712)	(4.283)	(0.491)	(6.428)
	[0.0777]	[0.0936]	[0.0813]	[0.0563]	[0.0690]
Harmonizationdif (Weighted)	-0.112	-0.483***	-0.395**	-0.0629	-0.311***
	(-0.838)	(-3.682)	(-2.777)	(-0.631)	(-3.558)
	[0.134]	[0.131]	[0.142]	[0.0998]	[0.0875]
Government effectiveness	-0.253	-0.272	-0.149	-0.00626	-0.324**
	(-1.209)	(-1.679)	(-0.694)	(-0.0350)	(-2.121)
	[0.209]	[0.162]	[0.215]	[0.179]	[0.153]
Regulatory quality	-0.479*	-0.378	-0.262	-0.301	0.242
	(-1.929)	(-0.959)	(-0.582)	(-1.139)	(0.713)
	[0.248]	[0.394]	[0.450]	[0.264]	[0.339]
Rule of law	0.904*	0.0529	0.714	0.723	-0.553**
	(1.856)	(0.124)	(1.454)	(1.032)	(-2.068)
	[0.487]	[0.427]	[0.491]	[0.701]	[0.267]
Health	0.155**	0.0869	0.111	0.131**	-0.0118
	(2.540)	(1.254)	(1.465)	(2.723)	(-0.339)
	[0.0610]	[0.0694]	[0.0760]	[0.0480]	[0.0348]
Education	0.0116*	0.00297	0.00891	0.00900	-0.00621*
	(1.986)	(0.494)	(1.511)	(1.593)	(-1.977)
	[0.00583]	[0.00600]	[0.00590]	[0.00565]	[0.00314]
Observations	141	194	196	209	288
R-squared	0.721	0.728	0.629	0.339	0.517
Number of countries	20	25	25	22	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. $\text{Harmonization}_{i,t} = \ln(1 + \text{lex}_{i,t})$ where $\text{lex}_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. $Harmonizationdif_{i,t} = Harmon_{i,t} - \left(\sum_i weight \times Harmon_{i,t}\right)$ where $weight = \frac{GDP_{i,t}}{\sum_i GDP_{i,t}}$. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. The regressions are estimated over 25 countries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2007. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Table 3.8: Financial development and financial harmonization; using a harmonization index of 21 directives

	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization (21 directives)	0.324***	0.582***	0.382***	0.0310	0.480***
	(3.830)	(5.761)	(4.304)	(0.499)	(6.432)
	[0.0846]	[0.101]	[0.0887]	[0.0620]	[0.0747]
Harmonizationdif (21 directives)	-0.123	-0.531***	-0.407**	-0.0612	-0.366***
	(-0.862)	(-3.786)	(-2.725)	(-0.561)	(-3.872)
	[0.143]	[0.140]	[0.149]	[0.109]	[0.0945]
Government effectiveness	-0.252	-0.272	-0.149	-0.00692	-0.324**
	(-1.203)	(-1.673)	(-0.689)	(-0.0386)	(-2.124)
	[0.209]	[0.162]	[0.216]	[0.179]	[0.153]
Regulatory quality	-0.478*	-0.379	-0.266	-0.300	0.240
	(-1.915)	(-0.964)	(-0.592)	(-1.133)	(0.705)
	[0.249]	[0.393]	[0.450]	[0.265]	[0.340]
Rule of law	0.913*	0.0538	0.721	0.719	-0.550*
	(1.878)	(0.126)	(1.460)	(1.027)	(-2.057)
	[0.486]	[0.426]	[0.494]	[0.700]	[0.267]
Health	0.155**	0.0872	0.111	0.131**	-0.0120
	(2.535)	(1.260)	(1.458)	(2.722)	(-0.343)
	[0.0612]	[0.0692]	[0.0763]	[0.0480]	[0.0349]
Education	0.0117*	0.00297	0.00901	0.00901	-0.00626*
	(1.992)	(0.494)	(1.525)	(1.593)	(-2.000)
	[0.00587]	[0.00602]	[0.00590]	[0.00565]	[0.00313]
Observations	141	194	196	209	288
R-squared	0.721	0.728	0.628	0.339	0.516
Number of countries	20	25	25	22	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. $Harmonization_{i,t} = \ln(1 + lex_{i,t})$ where $lex_{i,t}$ represents the sum of all 21 directives, which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. This sum excludes the 6 directives implemented after 2003. $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the *Worldwide Governance Indicators*, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. The regressions are estimated over 25 countries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2007. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Table 3.9: Financial development and financial harmonization; using a harmonization index of 7 banking directives

	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization (Banking directives)	0.494***	0.865***	0.568***	0.0457	0.715***
	(3.838)	(5.729)	(4.320)	(0.501)	(6.487)
	[0.129]	[0.151]	[0.131]	[0.0912]	[0.110]
Harmonizationdif (Banking directives)	-0.476**	-0.747***	-0.662***	-0.111	-0.538***
	(-2.285)	(-3.778)	(-3.811)	(-1.110)	(-4.127)
	[0.208]	[0.198]	[0.174]	[0.0998]	[0.130]
Government effectiveness	-0.222	-0.277	-0.146	-0.00129	-0.326**
	(-0.977)	(-1.702)	(-0.676)	(-0.00704)	(-2.232)
	[0.227]	[0.163]	[0.215]	0.182	[0.146]
Regulatory quality	-0.481*	-0.374	-0.265	-0.308	0.274
	(-1.959)	(-0.939)	(-0.596)	(-1.172)	(0.801)
	[0.246]	[0.399]	[0.445]	[0.263]	[0.342]
Rule of law	0.898*	0.0665	0.705	0.705	-0.543*
	(1.818)	(0.153)	(1.467)	(1.030)	(-2.017)
	[0.494]	[0.436]	[0.481]	[0.685]	[0.269]
Health	0.151**	0.0880	0.111	0.131**	-0.0130
	(2.549)	(1.278)	(1.459)	(2.681)	(-0.385)
	[0.0591]	[0.0689]	[0.0759]	[0.0489]	[0.0337]
Education	0.0108*	0.00311	0.00883	0.00906	-0.00656*
	(1.973)	(0.528)	(1.551)	(1.604)	(-2.051)
	[0.00547]	[0.00588]	[0.00569]	[0.00564]	[0.00320]
Observations	141	194	196	209	288
R-squared	0.714	0.729	0.629	0.340	0.516
Number of countries	20	25	25	22	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. $Harmonization_{i,t} = \ln(1 + lex_{i,t})$ where $lex_{i,t}$ represents the sum of all 7 banking directives, which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the *Worldwide Governance Indicators*, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. The regressions are estimated over 25 countries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2007. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Table 3.10: Financial development, financial harmonization with legal origin dummies

	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization	0.364***	0.500***	0.435***	0.0152	0.374***
	(4.620)	(5.300)	(4.640)	(0.263)	(4.786)
	[0.0788]	[0.0943]	[0.0938]	[0.0581]	[0.0781]
Harmonizationdif	-0.0692	-0.355**	-0.525***	0.0767	-0.187
	(-0.495)	(-2.393)	(-3.789)	(0.654)	(-1.562)
	[0.140]	[0.149]	[0.139]	[0.117]	[0.119]
Gov. effectiveness	0.0735	0.280	0.320	0.0736	0.271
	(0.282)	(1.101)	(1.189)	(0.393)	(1.129)
	[0.261]	[0.254]	[0.269]	[0.187]	[0.240]
Regulatory quality	1.086***	0.792***	0.253	0.449***	1.030***
	(5.042)	(2.767)	(0.989)	(2.611)	(4.696)
	[0.215]	[0.286]	[0.256]	[0.172]	[0.219]
Rule of law	-0.434*	-0.235	0.283	-0.522**	-0.387
	(-1.668)	(-0.931)	(1.055)	(-2.304)	(-1.569)
	[0.260]	[0.252]	[0.268]	[0.227]	[0.246]
Health	0.0352	0.0327	-0.105***	0.113***	0.0566**
	(1.088)	(1.128)	(-3.961)	(5.183)	(2.338)
	[0.0323]	[0.0290]	[0.0266]	[0.0218]	[0.0242]
Education	0.00695*	0.00448	-0.00351	0.0119***	0.00462
	(1.905)	(0.903)	(-0.746)	(3.676)	(0.964)
	[0.00365]	[0.00496]	[0.00471]	[0.00324]	[0.00479]
Legal origin UK	-2.264***	-1.736***	1.201**	-3.044***	-2.726***
	(-3.825)	(-2.986)	(2.129)	(-6.600)	(-5.158)
	[0.592]	[0.581]	[0.564]	[0.461]	[0.529]
Legal origin French	-2.124***	-2.134***	0.432	-2.688***	-2.586***

	(-3.896)	(-3.809)	(0.773)	(-5.638)	(-4.764)
	[0.545]	[0.560]	[0.559]	[0.477]	[0.543]
Legal origin Socialist	-3.537***	-3.492***	-1.132**	-3.279***	-3.561***
	(-6.887)	(-6.272)	(-2.084)	(-7.552)	(-6.781)
	[0.514]	[0.557]	[0.543]	[0.434]	[0.525]
Legal origin German	-2.427***	-2.540***	0.759	-2.585***	-3.610***
	(-3.885)	(-4.055)	(1.286)	(-5.226)	(-6.340)
	[0.625]	[0.626]	[0.590]	[0.495]	[0.569]
Legal origin Scandinavian	-2.287***	-2.639***	-0.220	-2.001***	-2.324***
	(-3.792)	(-3.917)	(-0.331)	(-3.911)	(-3.569)
	[0.603]	[0.674]	[0.664]	[0.512]	[0.651]
Observations	141	194	196	209	288
R-squared	0.784	0.739	0.770	0.526	0.598

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. $\text{Harmonization}_{i,t} = \ln(1 + \text{lex}_{i,t})$ where $\text{lex}_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. Legal origin dummy variables provide the legal origins of the U.K., France, Socialist countries, Germany and Scandinavian countries respectively. The data for legal origins comes from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). The regressions are estimated over 25 countries and 12 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2007. The above estimations include time fixed effects that are not reported here. t – statistics reported in the tables are robust to heteroskedasticity and autocorrelation.

Table 3.11: Financial development, financial harmonization with crisis period data

	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization	0.360***	0.367***	0.529***	0.142	0.173***
	(4.933)	(6.301)	(6.148)	(1.586)	(4.159)
	[0.0730]	[0.0583]	[0.0860]	[0.0895]	[0.0417]
Harmonizationdif	-0.131	-0.310**	-0.538***	-0.135	-0.0869
	(-1.209)	(-2.599)	(-3.516)	(-0.966)	(-1.139)
	[0.109]	[0.119]	[0.153]	[0.140]	[0.0763]
Gov. effectiveness	-0.222	-0.354**	-0.373	-0.108	-0.297**
	(-1.079)	(-2.466)	(-1.316)	(-0.363)	(-2.130)
	[0.206]	[0.144]	[0.283]	[0.298]	[0.140]
Regulatory quality	-0.608***	-0.286	-0.335	-0.363	0.171
	(-2.927)	(-0.814)	(-0.827)	(-1.279)	(0.553)
	[0.208]	[0.352]	[0.405]	[0.284]	[0.310]
Rule of law	0.365	0.210	0.886*	0.631	-0.476**
	(1.200)	(0.665)	(1.846)	(0.776)	(-2.267)
	[0.304]	[0.317]	[0.480]	[0.812]	[0.210]
Health	0.00969	0.0197	0.0422	0.0368	-0.0181
	(0.221)	(0.467)	(0.750)	(0.776)	(-0.529)
	[0.0438]	[0.0422]	[0.0564]	[0.0474]	[0.0343]
Education	0.00907***	0.00443	0.0141**	0.00876	-0.00523
	(3.140)	(1.167)	(2.180)	(1.665)	(-1.660)
	[0.00289]	[0.00379]	[0.00645]	[0.00526]	[0.00315]
Observations	180	234	236	270	360
R-squared	0.786	0.747	0.688	0.347	0.485
Number of countries	21	25	25	22	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. The regressions are estimated over 25 countries and 15 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2010. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Table 3.12: Financial development, financial harmonization with crisis period data, interaction terms

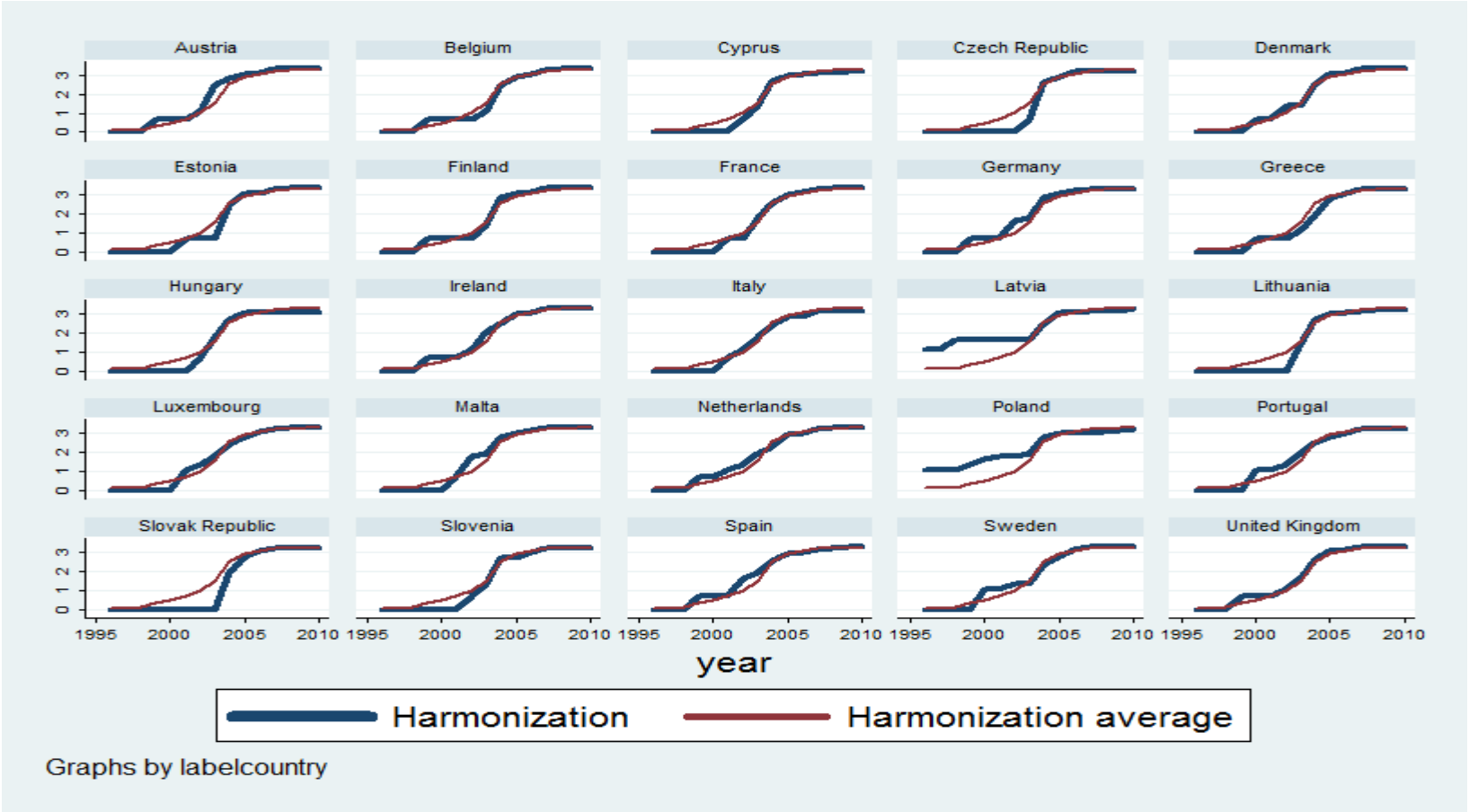
	Dependent Variables				
VARIABLES	**(1) Financial development**	**(2) Financial development***	**(3) Banking sector development**	**(4) Bond market development**	**(5) Stock market development**
Harmonization	0.458***	0.529***	0.382***	0.102	0.440***
	(5.837)	(6.827)	(4.607)	(1.353)	(6.220)
	[0.0784]	[0.0775]	[0.0828]	[0.0752]	[0.0707]
Harmonizationdif	-0.244**	-0.485***	-0.420***	-0.100	-0.351***
	(-2.407)	(-4.325)	(-3.283)	(-0.984)	(-4.050)
	[0.101]	[0.112]	[0.128]	[0.102]	[0.0866]
Gov. effectiveness	-0.182	-0.289*	-0.104	0.119	-0.317**
	(-1.000)	(-2.058)	(-0.496)	(0.555)	(-2.231)
	[0.182]	[0.140]	[0.210]	[0.215]	[0.142]
Regulatory quality	-0.627**	-0.435	-0.686	-0.364	0.189
	(-2.694)	(-1.056)	(-1.561)	(-1.342)	(0.556)
	[0.233]	[0.412]	[0.439]	[0.271]	[0.339]
Rule of law	0.257	0.0590	0.615	0.521	-0.456**
	(0.920)	(0.183)	(1.420)	(0.823)	(-2.240)
	[0.279]	[0.322]	[0.433]	[0.633]	[0.204]
Health	0.0675	0.0491	0.0817	0.0330	-0.0176
	(1.524)	(0.923)	(1.258)	(1.021)	(-0.567)
	[0.0443]	[0.0532]	[0.0650]	[0.0323]	[0.0311]
Education	0.00879**	0.00377	0.0120**	0.00697	-0.00501**
	(2.658)	(0.956)	(2.309)	(1.405)	(-2.081)
	[0.00331]	[0.00394]	[0.00521]	[0.00496]	[0.00241]
Crisis	26.14	23.49	17.03	-2.425	19.86
	(1.087)	(1.124)	(0.812)	(-0.176)	(1.426)
	[24.05]	[20.89]	[20.98]	[13.77]	[13.93]
$(Harmonization \times crisis)$	-7.751	-7.199	-5.877	-0.149	-5.949

	(-1.058)	(-1.127)	(-0.913)	(-0.0349)	(-1.383)
	[7.324]	[6.389]	[6.438]	[4.263]	[4.303]
$(Harmonizationdif \times crisis)$	11.06	9.120	5.253	0.707	5.872
	(1.365)	(1.222)	(0.681)	(0.158)	(1.282)
	[8.099]	[7.464]	[7.717]	[4.476]	[4.582]
$(Gov.effectiveness \times crisis)$	-0.637*	-0.430	-0.666	-0.160	-0.225
	(-1.844)	(-1.052)	(-1.282)	(-0.396)	(-0.530)
	[0.345]	[0.409]	[0.519]	[0.404]	[0.424]
$(Reg.quality \times crisis)$	0.662	0.694	1.515**	0.472	-0.328
	(1.145)	(0.887)	(2.190)	(1.091)	(-0.690)
	[0.578]	[0.782]	[0.692]	[0.432]	[0.476]
$(Rule\ of\ law \times crisis)$	0.0599	-0.0685	-0.494	-0.325	0.507
	(0.126)	(-0.132)	(-0.866)	(-0.878)	(1.171)
	[0.474]	[0.519]	[0.570]	[0.371]	[0.433]
$(Health \times crisis)$	-0.0977***	-0.0771**	-0.134**	-0.0321	0.0256
	(-3.349)	(-2.606)	(-2.721)	(-0.702)	(1.377)
	[0.0292]	[0.0296]	[0.0493]	[0.0458]	[0.0186]
$(Education \times crisis)$	6.64e-05	0.00283	0.0378**	0.0334***	-0.0145
	(0.00643)	(0.173)	(2.197)	(3.170)	(-1.492)
	[0.0103]	[0.0164]	[0.0172]	[0.0105]	[0.00973]
Observations	180	234	236	270	360
R-squared	0.816	0.766	0.769	0.468	0.497
Number of countries	21	25	25	22	25

Note: t-statistics are in parentheses (*** p<0.01, ** p<0.05, * p<0.1) and standard errors are in brackets. *Financial development*, *Financial development**, *Banking sector development*, *Bond market development* and *Stock market development* are all indices calculated using principal components analysis. Harmonizationi,t = ln (1 + $lex_{i,t}$) where $lex_{i,t}$ represents the sum of all 27 directives which take on a value of 1 on and after the date that the directive under consideration goes into effect in that particular country, and a value of 0 otherwise. $Harmonizationdif_{i,t} = Harmonization_{i,t} - Harmonizationave_t$ where $Harmonizationave_t$ is the average harmonization across countries per year. *Government effectiveness*, *Regulatory quality* and *Rule of law* are legal and institutional variables taken from the Worldwide Governance Indicators, *Health* is the percentage of government expenditure that is devoted to public health, and *Education* is the gross percentage of secondary school enrollment rate. *Crisis* is an indicator that takes on a value of 1 on and after 2008 and a value of 0 otherwise. The regressions are estimated over 25 countries and 15 years. The 25 European Union countries included are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland,

Slovakia, Slovenia, Spain, Sweden and the UK. The estimation period in our regressions is 1996 – 2010. The above estimations include country and time effects that are not reported here. t – statistics reported in the tables are based on country-specific (clustered) heteroskedasticity and autocorrelation.

Figure 3.1: Evolution of Financial Harmonization Policies across European Countries



The figure above is generated in Stata and depicts the graphs for the harmonization index that is constructed using 27 directives of the Financial Services Action Plan and the harmonization average indicator which is the mean value of the harmonization index of 25 European countries per each year in our sample size.